

International Abstract of Surgery

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INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

EYE

Pavia, L., and Valda Arana, R.: Serous Tenonitis (Tenonitis serosa). *Rev. de especialidades, Asoc. med. argent.*, 1930, v, 1546.

Very few cases of inflammation of Tenon's capsule have been reported in the literature. When an effusion develops in Tenon's capsule it pushes the eyeball forward and causes an intense and characteristic chemosis, an oedema of the eyelids, limitation of movement of the eyeball, and pain.

In the case reported by the author, that of a patient eighteen years of age, roentgen examination of the skull showed the sella turcica to be very small and the clinoid processes very close together. The anterior half of the hypophysis showed fibrous induration. Under treatment with calcium, the attacks decreased in severity and in the last four months there has been none at all.

The author concludes that serous tenonitis is caused by a general disturbance due to hypocalcemia probably brought about by abnormality of the endocrine glands. The only endocrine dysfunction that can be demonstrated is hypofunction of the hypophysis.

ANDREW G. MORGAN, M.D.

Green, J.: The Management of Orbital Infections. *Am. J. Ophth.*, 1931, xiv, 196.

The author reports seven cases of orbital infection in which the treatment varied with the type, the cause, and the progress or recession of the infection. In some of the cases conservative treatment was sufficient; in others, minor surgery was done; and in others, radical operation was necessary to save life.

THOMAS D. ALLEN, M.D.

Wheeler, J. M.: Exophthalmos Associated with Diabetes Insipidus and Large Defects in the Bones of the Skull. *Arch. Ophth.*, 1931, v, 161.

The condition discussed in this article is known as Schuler's or Christian's disease. Wheeler says that when an ophthalmologist observes unilateral or bi-

lateral exophthalmos in a child without evident cause, he should examine for defects in the skull and hip bones and question the parents as to the occurrence in the patient of excessive thirst and urination.

The Wassermann test, the tuberculin test, and chemical studies of the blood have shown nothing of importance. The defect may be considered a neoplastic process involving the structures in the floor of the third ventricle, invading the orbit, and involving the bones. It may consist of a yellow, nodular, lipid-storage xanthoma. The diabetes insipidus may be accounted for by the disturbance in the floor of the third ventricle with or without invasion of the hypophysis. The bone condition is probably due to invasion by the hyperplastic process. The exophthalmos is probably due, not to mere loss of bone, but to true invasion by the process.

The hypophysis may be involved without disturbance of the sella turcica. When it is injured, asexuality and other evidences of hypophyseal dysfunction may result.

LESLIE L. MCCOY, M.D.

De Grósz, E.: The Operative Treatment of Glaucoma. *Arch. Ophth.*, 1931, v, 327.

The author reviews the history of operations for glaucoma, discusses his own very extensive experience with the various surgical procedures, and reviews the results of 1,897 iridectomies, 600 trephinations, 121 LaGrange operations, 760 cyclodialyses, and 175 anterior sclerectomies.

Iridectomy is done in acute glaucoma and the prodromal stage. Cyclodialysis or trephining is done in chronic inflammatory glaucoma. The LaGrange operation is employed in simple glaucoma. In degenerative or absolute glaucoma, the eye is enucleated.

SAMUEL A. DURK, M.D.

Appelmans, M.: The Treatment of Epithelioma of the Eyelid (Le traitement des épithéliomas des paupières). *Rev. belge d. sc. méd.*, 1930, ii, 829.

The author uses radium for certain conditions in which the choice between radium and surgery is still

under discussion. In epithelioma of the eyelid he recognizes the following indications for radium irradiation: (1) small lesions not recurrences from previous treatment, (2) small lesions on the inner third of the eyelid, (3) lesions which have invaded the orbit, (4) lesions recurring after surgery, and (5) lesions recurring after irradiation. He reviews the literature on the choice between irradiation and surgery for these lesions and cites statistics with regard to the age incidence and most common sites of the epithelioma. He summarizes his treatment as follows:

1. *Small tumors not recurrences and not involving soft tissues or the function of the eyelid.* If the growth is exuberant externally, it is sometimes removed superficially by electrocoagulation. In any case, radium tubes 12 mm. long, containing 2 mgm. of the element, are pasted against the skin with bands of wax cloth. A 1-mm. platinum filter is used without a secondary filter. As many tubes as are necessary to cover the tumor and a margin of sound tissue 1 cm. wide around it are applied 1 cm. apart. The application is renewed each day. The duration of the treatment is seventy-two hours. The secondary dermatitis is treated with an oxidizing wash and Lassar's paste. The lesion is covered only with thin gauze which can be penetrated by the air.

2. *Small tumors located on the mesial third of the lid.* These growths often penetrate more deeply than clinical examination suggests. If it is certain that the soft tissues are not invaded, the treatment is the same as that described for tumors of Group 1. If the extent of the invasion is doubtful, a moulded preparation or distant radium therapy is applied. In the use of a moulded preparation, 1.5 mc. must be destroyed per square centimeter of radiant surface. The dose is 100 mgm. filtered with 1 mm. of platinum and distributed as evenly as possible on the surface of the preparation. The eye is protected by a lead cap lined on the inner surface with rubber.

3. *Tumors involving the soft tissues of the orbit.* If it seems possible to save the eye, a moulded preparation or distant radium therapy is used. The dosage, the distance, and the number of millicuries to be destroyed per square centimeter of radiant surface are the same as in cases of tumors located on the mesial third of the eyelid. In some cases the moulded preparation is later supplemented by radium puncture. Low-dosage needles separated from each other by 1 cm. are left in place for five days. The radium puncture is followed by an application with the moulded preparation of 0.5 mc. per square centimeter of radiant surface. The technique of distant radium therapy depends on the quantity of radium and the apparatus used. If the eye is too greatly involved, it is enucleated with surgical diathermy. After electrocoagulation of the cavity, 2-mgm. radium tubes in a wax-cloth dressing are applied as in the treatment of tumors of Group 1 and are left in place for at least thirty-six hours.

4. *Recurrences after surgery.* Recurrences after surgery are placed in a special group because they often involve more tissue than is expected. Their

treatment is the same as that of tumors of Group 1, 2, or 3.

5. *Recurrences after irradiation therapy.* If the recurrence follows an underdose of irradiation, it is treated in the same way as tumors in Groups 1, 2, or 3. If it follows an overdose, radical extirpation by surgical diathermy precedes the application of radium.

Of the sixty patients who were treated by the author in the period from 1925 to 1928, 27 have remained cured, 4 developed a recurrence, 8 are dead, and 21 did not reply to a request for a report. The sequelæ of scar retraction of the lid or adhesions to the orbit are perhaps less likely to occur after radium irradiation than after surgery, but regardless of the treatment used, such sequelæ are to be feared when the tarsus is invaded. CURTIS NELSON, M.D.

Moore, J. E.: Syphilitic Iritis. *Am. J. Ophth.*, 1931, xiv, 110.

This discussion is summarized as follows:

1. This article is based on 249 patients with syphilitic iritis, of whom 111 had early secondary syphilis, 29 had recurrent secondary syphilis, and 109 had late syphilis.

2. Whether early or late, iritis is twice as common in colored persons as in white persons with syphilis, and slightly more frequent in males than in females.

3. Iritis may be expected to occur in from 4 to 5 per cent of all persons with early secondary syphilis. It is almost twice as frequent in recurrent secondary syphilis, and is a fairly common manifestation of late syphilis.

4. The diagnosis of syphilitic iritis depends upon the examination of the patient as a whole. A history of syphilis is of diagnostic importance in early and recurrent iritis but not in late iritis. A complete physical survey is necessary to determine the presence or absence of associated syphilitic lesions.

5. The blood Wassermann test is positive in 97 per cent of the early cases of iritis, but in only 55 per cent of the cases of recurrence and 81 per cent of the cases of late syphilitic iritis.

6. Spinal fluid findings in 104 patients with iritis indicate that lumbar puncture alone is of little diagnostic aid. However, they show that asymptomatic neurosyphilis is no more frequent in persons with iritis, whether early or late, than in those without it.

7. In early syphilitic iritis, associated lesions of early syphilis may be found in practically every case. In the cases reviewed, 75 per cent of the patients had generalized eruptions, but in about one-fourth the associated lesions were so insignificant as to be easily overlooked.

8. In negroes with early syphilitic iritis, the most commonly observed rash was in the group with the folliculopapular syphilide and often associated with marked polyadenitis and syphilitic arthritis.

9. Iritis as a manifestation of recurrent secondary syphilis is usually a monorecurrence and unilateral, the blood Wassermann reaction being negative. In

7 of 29 cases reviewed it was associated with a neurorecurrence.

10. These facts suggest an explanation for the probable mechanism of iridorecurrence, which may be similar to that of neurorecurrence.

11. In late syphilitic iritis other manifestations of syphilis could be found in 50 per cent of the patients.

12. Iritis is often complicated by other ocular lesions of syphilis (one-half of early cases, two-thirds of recurrent cases, three-fourths of late cases) which are potentially more threatening to vision than iritis. The most common complication is keratoiritis.

13. Iritis is often an early manifestation of secondary syphilis. In the cases reviewed there was no tendency for it to be associated with an unusually severe secondary outbreak.

14. Early iritis shows no special tendency toward subsequent relapse.

15. Recurrent iritis usually appears within the first four months after the inadequate treatment of early syphilis. It may be, but usually is not, more serious or fulminating than early iritis.

16. Late iritis appears on an average nine years after the infection. It often exists for long periods of time (from two to ten years) before the diagnosis of syphilis is made.

17. Confusion in the diagnosis between syphilitic iritis and iritis due to some other cause in a syphilitic patient is frequent. The usually reliable therapeutic test is not to be depended on in late syphilitic iritis because of the slow response of certain syphilitic lesions and the non-specific response produced by arsphenamin in certain non-syphilitic iritides.

18. Repeated relapse is frequent in late syphilitic iritis, in contrast to the iritis of early and recurrent secondary syphilis.

19. Secondary glaucoma is an uncommon sequela of early and recurrent iritis, but is frequent and dangerous to vision in late iritis.

20. The importance of trauma in the etiology of syphilitic iritis and the effect of operative procedures on the eyes of syphilitic patients are briefly considered.

21. The treatment of syphilitic iritis, complicated or uncomplicated, is that of general syphilis and should be given under the supervision or with the advice of the syphilologist.

22. The ultimate outcome of syphilitic iritis so far as vision is concerned, is good in 70 per cent of the early cases, 58 per cent of recurrent cases, and 42 per cent of the late cases. Poor results, blindness or permanent impairment of vision, are due partly to irremediable complications or sequelae of iritis and partly to failure to arrive at an early diagnosis and institute prompt treatment.

LESLIE L. MCCOV, M.D.

O'Malley, C. C.: Intracapsular Cataract Extraction at Moga, Punjab. *Brit. J. Ophth.*, 1931, xv, 152.

The author, having visited India and operated upon about 200 cataracts while there, describes the

conditions under which surgeons in India work. In the few days or weeks of the clinics large numbers of people must be treated. O'Malley's chief once performed 1,019 cataract extractions in four days. O'Malley describes the transparency of many of the lenses removed. It is necessary to operate upon both eyes at once. Many operations are performed in spite of infected conjunctival sacs and trachomatous lids. It is impossible to hold the patients long enough to fit them with glasses or to follow them up for post-operative study. O'Malley describes the technique of the Smith operation as done by Das and the complications that are found at the first dressing six days later. He believes this operation is better than any of the others.

THOMAS D. ALLEN, M.D.

EAR

Coates, G. M.: The Treatment of Chronic Running Ears, or Chronic Suppurative Otitis Media. *Ohio State M. J.*, 1931, xxvii, 128.

This article is a summary of the various procedures in common use in the treatment of chronic suppurative otitis media. No one procedure will be successful in all cases, and the results of each method differ under different conditions and when the method is used by different otologists.

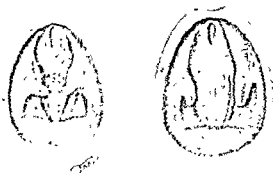
A satisfactory result of treatment is better described as an "arrest" than as a "cure" of the condition since recurrence of the suppuration may be brought about by re-infection following trauma, a general pathological condition which lowers the resistance, the entrance of water into the ear, or some other factor. Moreover, hearing is never restored to normal. Hearing is sometimes improved after the arrest of the discharge, but in some cases may be much worse. When, following treatment, the ear shows an occasional slight odorless moisture of a mucoid character and no evidence of extension of the suppurative or necrotic process, the result is to be considered good. Such moisture usually has its origin in the tubal membrane or an inaccessible tubal cell. According to Turner and Fraser, a residual discharge of this type is present after radical mastoid operation in a definite percentage of cases.

JAMES C. BRASWELL, M.D.

PHARYNX

Dorrance, G. M.: The So-Called Bursa Pharyngea in Man: Its Origin, Relationship to the Adjoining Nasopharyngeal Structures, and Pathology. *Arch. Otolaryngol.*, 1931, xiii, 187.

The bursa pharyngea is a sac-like depression in the posterior wall of the nasopharynx just above the uppermost fibers of the superior constrictor muscles which usually extends upward and backward toward the occipital bone and sometimes reaches the latter with its apex. It is an independent structure in adults and occurs somewhat frequently during embryonal life. It takes its origin from adhesions of the notochord to the pharyngeal entoderm. In



The bursa pharyngea in an adult with cleft palate. Note Passavant's cushion formed by the pteryopharyngeus portion of the superior constrictor muscle of the pharynx as the patient makes an effort at gagging. The sides of the cleft in the velum tend to come together in the mesial line. The tips of the cleft uvula are rotated inward.

embryonal life its location varies with the age of the embryo. It is not the same structure as Rathke's pouch, nor is it Seessel's pocket, a distinction which was clearly made by Huber. It may be associated with cleft palate, but is not embryologically related to the palate. In the adult it may be the site of inflammation and cyst formation.

GEORGE R. McAVULF, M.D.

NECK

Zechel, G.: Follicular Destruction in the Normal Thyroid of the Dog; with a Consideration of the Relation between Follicles and Interfollicular Cells. *Surg., Gynec. & Obst.*, 1931, lli, 228.

In the normal thyroid of the dog that author has noted evidence of the destruction of follicles and the formation of new follicles. He has found that the follicle is not a permanent structure, but merely a phase in a metamorphosis which alternates between two extremes—the follicles on one end and the interfollicular cell group on the other. Regression of the follicles seems to facilitate the resorption of colloid. The disintegration of the follicular walls permits the colloid to escape easily and appear among the surrounding cells. If these deductions are correct, it is conceivable how differences in pathological conditions may result from the unbalance or exaggeration of any one phase in the follicular life cycle of the thyroid. M. HERBERT BARKEE, M.D.

Morris, R. S.: The "Thyroid Heart" with a Low Basal Metabolic Rate. *Am. J. M. Sc.*, 1931, clxxxi, 297.

Morris finds that certain patients with circulatory failure, with or without auricular fibrillation, and with a normal or low basal metabolic rate show improvement after subtotal thyroidectomy. As a rule, in such cases, there is a history of a pre-existing thyrotoxic state, which is due somewhat more fre-

quently to toxic adenomata than to Graves' disease. Hypertension is common, but decreases after thyroidectomy unless the arteries are extensively diseased. If careful pre-operative treatment is given, a surprising amount of improvement is noted even when the condition has been present for some time and extensive myocardial damage has occurred. The low metabolic rate reacts to Lugol's solution and subtotal thyroidectomy in the same way as in cases of toxic goiter. The diagnosis of the condition will be missed if only the metabolic rate is considered.

F. S. MODERN, M.D.

Schellingart, M.: Adenomatous Goiters (Les goitres adénomateux). *Rev. Sud.-Am. de med. et de chir.*, 1930, I, 1193.

After reviewing the gross and histological anatomy of the thyroid the author classifies thyroid tumors into colloid goiter, adenomatous goiter without hyperthyroidism, toxic adenomatous goiter, and Basedow's disease.

The colloid goiter of adolescence generally develops into an adenomatous goiter. Most of the symptoms in adenomatous goiter without hyperfunction of the thyroid are due to disequilibrium of the vegetative nervous system. They are rather vague and indefinite. The patient may complain of his stomach one day and of his heart the next. The pulse rate generally ranges from 80 to 90. The slightest emotional disturbance accelerates the heart. The blood pressure and vasomotor equilibrium are very unstable. Pain is quite frequent, and intermediate metabolism is disturbed. The basal metabolism is not increased. If the goiter persists long enough, the vagosympathetic system and the heart are permanently affected and the symptoms are therefore not relieved by operation. Non-hyperthyroid goiter acts mechanically by exerting pressure on the pneumogastric and sympathetic.

Hyperthyroid or toxic adenomatous goiter differs from the non-toxic goiter in being more vascular. A simple hyperplasia or hypertrophy of the thyroid does not necessarily mean hyperthyroidism. It may be compensatory in nature, as in cretinism, or limited to certain regions in a non-hyperthyroid goiter. A diagnosis based solely on microscopic examination may therefore be wrong. The author does not believe it possible to make a definite distinction between toxic goiter and Basedow's disease. In his opinion these conditions differ in degree rather than in nature.

The most prominent symptoms of toxic goiter are the heart disturbances. The condition is characterized by tachycardia, high blood pressure, arrhythmia, and cardiac dyspnea. The left heart finally hypertrophies. The heart disturbances are due beyond doubt to an excess of thyroid secretion in the blood. They improve greatly or disappear if the goiter is extirpated before irremediable changes have taken place.

Adenomatous goiter may be treated medically, surgically, or by irradiation. The best medical

treatment is the administration of iodine in the form of Lugol's solution. The author regards this treatment as definitely indicated and without any contra-indication in exophthalmic goiter. He has never seen it aggravate the symptoms. In cases of non-hyperthyroid adenomatous goiter he gives 10 drops of Lugol's solution a day for ten days and allows an interval of a week between treatments. In cases of small adenomatous goiter without signs of hyperthyroidism he gives iodine or small doses of thyroid extract—2 or 3 ctgm.—daily for fifteen days and separates the treatments by an interval of ten days. This treatment may be continued for a long time without doing any harm. In cases of larger nontoxic goiters with signs of mechanical compression, operation should be performed at once. Roentgen treatment is contra-indicated in adenomatous goi-

ters without hyperthyroidism with a normal or decreased basal metabolism. In cases of large toxic adenomatous goiters with signs of hyperthyroidism operation should be performed as soon as possible, before irreparable damage is done. Roentgen treatment may be given if the goiter is small and the symptoms not very intense or if operation is contra-indicated by the general condition. If hyperthyroid goiter is operated on at the right time a cure is obtained in from 80 to 90 per cent of the cases. The mortality is low; at the Mayo Clinic it is barely 1 per cent. Failure of operation may be due to hyperfunctioning nodules left behind or a retrosternal adenoma not discovered. The author thinks that any hypertrophied goiter should be operated on after it has resisted medical and roentgen treatment for six months.

AUDREY GOSS MORGAN, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Egidi, G.: Treatment of Craniocerebral Traumatic Lesions Exclusive of Those Due to Firearms (Trattamento delle lesioni cranio-cerebrali traumatiche escluse quelle da arma da fuoco). *Arch. ital. di chir.*, 1930, xxvii, 789.

Giacobbe, C.: Treatment of Craniocerebral Trauma (Except Those Due to Firearms) in Military Medicine (Trattamento dei traumi cranio-cerebrali, esclusi quelli da arma da fuoco, in medicina militare). *Arch. ital. di chir.*, 1930, xxvii, 798.

Alberti, O.: Roentgen Examination in the Treatment of Craniocerebral Trauma (Il sussidio radiologico nel trattamento dei traumi cranio-cerebrali). *Arch. ital. di chir.*, 1930, xxvii, 803.

EGIDI discusses the usual treatment of fractures of the skull by revision and cleansing of the wound, the removal of foreign bodies and crushed tissue, and suture. He states that there is still a difference of opinion as to whether the wound should be closed primarily or drained. Drainage involves the risk of secondary infection, while primary closure involves the risk of sepsis from infectious material overlooked in the first treatment.

Hæmatoma may be diagnosed by cranial puncture or by roentgenographic examination made after the subdural space and ventricles have been filled with gas. In recent cases substitution of air for the spinal fluid by the lumbar route is associated with some danger.

In the treatment of threatening cerebral compression puncture of the skull and aspiration may be done. The classical trephination has lost ground somewhat in favor of osteoplastic resection of the skull which permits a certain amount of exploration of the skull cavity and the treatment of any lesions that may be found. However, exploratory puncture has rendered operative exploration less necessary. The method of decompression in most common use is trephination.

Among internal remedies, atropin is of value. Dehydration may be brought about also by the administration of hypertonic salt solution intravenously or of magnesium sulphate or salt solution by mouth or rectum. Dehydrating therapy is absolutely contraindicated in hypothermia with a rapid pulse due to hæmorrhage and in the type of shock resembling histamin shock, caused by a decrease in the volume of the blood from transudation into the tissues.

In cases of shock associated with cerebral compression, treatment is very difficult. In some cases life may be saved by the immediate injection of glucose solution to combat the shock and puncture of the ventricles or lumbar puncture to relieve the cerebral compression. When the shock is overcome, dehy-

drating treatment with magnesium sulphate should be given.

In general, the treatment should be regulated by the pulse and respiration. A pulse above 120 indicates the necessity for fluid, whereas irregular respiration or respiration below 20 indicates dehydration. For disturbances of respiration, symptomatic treatment should be given. Death from cerebral trauma is respiratory death, but often the medulla does not show any demonstrable change, and it is probable that the lesions are functional and curable.

GIACOBBE reviews 257 cases of craniocerebral trauma caused by falls from horses, the kick of a horse, or aviation accidents. The treatment was satisfactory in the early cases and unsatisfactory in the cases which were seen late. There were 44 deaths, a mortality of 17.12 per cent. Twenty-one of the deaths occurred within the first thirty-six hours, a fact indicating that the great danger in craniocerebral trauma is not infection, but the degree of compression and hypertension.

ALBERTI emphasizes the importance of co-operation between the roentgenologist, surgeon, and neurologist in the management of craniocerebral trauma. He reviews the types of fracture and the technical devices necessary to demonstrate them in different regions. He discusses the use of encephalography on the basis of 300 cases and shows that if a careful technique is employed the procedure is free from danger. He states that roentgen treatment may be useful in bringing about more rapid absorption of extravasations or newly formed connective tissue or in correcting intracranial hypertension.

In the discussion of these reports, BALDO said that among 1,064 cases of craniocerebral trauma seen during the last decade in Milan there were 640 deaths. In 68 per cent of the fatal cases death occurred within the first forty-eight hours and the condition was so serious that operation would have been of no avail. Baldo has no faith in decompressive trephination. He emphasized the importance of stereoroentgenography, with which even the shadow of a hæmatoma may sometimes be seen.

LUSENA discussed traumatic cephalohydrocele in children, an unusual condition. He emphasized that this should be known by surgeons in order that they may operate early and prevent disastrous late effects such as epilepsy and paralysis.

GAMBERINI reviewed 132 cases of concussion with 16 deaths, 59 fractures of the vault with 10 deaths, and 74 fractures of the base with 10 deaths. When there were focal symptoms, operation was performed, but when there were only diffuse signs of hyperpressure, derivation was practiced by lumbar puncture.

SEVERI stated that in cases of fracture of either the vault or the base of the skull without signs of concussion he had found no increase in the blood sugar. Glycemia increased with the severity of concussion and decreased with improvement in the clinical symptoms of concussion.

ALESSANDRI advocated operation for cases of depressed fracture. He stated that in cases in which only the internal table is fractured roentgenoscopy, particularly stereoscopic roentgenoscopy, is of great aid in the diagnosis. In many cases of fracture of the base of the skull nothing can be done, but in some of them lumbar puncture brings about great improvement. Alessandri believes that the use of hypertonic solutions represents an advance in treatment. He thinks that ventriculography and encephalography can rarely be used in recent cases and always demand great caution.

DONATI said that there is no essential difference between civil and military practice in the treatment of craniocerebral trauma. He emphasized the importance of neurological examination and advocated subtemporal decompressive trephination, which he believes is not dangerous if it is done under local anesthesia. He stated that in fracture of the base of the skull nothing can be done except decompressive trephination and lumbar puncture. He has found that epilepsy following trauma is often due to overlooked bone fragments or adherent scars.

SBROZZI reported 72 cases of craniocerebral trauma, 43 of them fractures of the base of the skull. He stated that in fracture of the base of the skull nothing can be done except lumbar puncture. For other fractures he recommended early operation and complete primary suture.

BAGGIO described his method of filling defects in the skull with multiple separate flaps of scalp, periosteum, and external table.

CAPELLI reported cases of psychic disturbances developing after craniocerebral trauma.

MAGRASSI said that, in the cases of adults, depressed fracture should be treated by operation, but in the cases of children, conservative treatment should be the rule.

SOLARO described cases of craniocerebral trauma in early infancy followed by defects in the skull due, not to actual loss of substance, but evidently to dystrophy of the membranous tissue from which the bones of the vault develop. In addition to the breach in the bone, there were defects in the dura mater through which the brain tissue herniated and became adherent to the opening in the bone. Solaro emphasized that particularly in craniocerebral trauma in young children operation is necessary to prevent such adhesions.

D'AGATA said that he generally operates in fracture of the vault of the skull and obtains good results even in cases which are severe. In fracture of the base of the skull he brings about decompression by lumbar puncture or by dehydration with hypertonic salt solution or glucose solution.

AUDREY G. MORGAN, M.D.

Carrillo, R.: Roentgenography of the Fourth Ventricle (*La radiografía del cuarto ventrículo*). *Bol. inst. de clin. quir.*, 1930, vi, 227.

The value of ventriculography with air or lipiodol has been demonstrated in lesions of the anterior and middle fossae. Just as processes in the anterior and middle parts of the brain cause changes in the form and position of the third and lateral ventricles, lesions of the cerebral and cerebellar peduncles and in general all lesions below the tentorium cause deformities of the fourth ventricle. In the study of the fourth ventricle lipiodol must be used because air is so light that it rises to the lateral ventricles and the mastoid cavities are so near that even if air is demonstrated it is not conclusive. Moreover, air causes intense meningeal reactions, whereas lipiodol does not, and air is very difficult to inject into so small a cavity as it tends to escape through the puncture opening.

The lipiodol demonstration of the fourth ventricle is particularly important as it helps in the diagnosis of diseases of the cerebellar fossa which are very difficult to diagnose clinically.

The normal ventricle may be square, triangular with the vertex backward, oval, or triangular with the vertex upward and an undulant base. Tumors and inflammations of the region cause changes in the position and form of the shadow. The aqueduct of Sylvius may be completely or partially obstructed or displaced from the midline. Changes in the lower pole or lower vertex of the ventricle are due to obstruction of the foramen of Magendie or the posterior cerebellomedullary cistern. Changes in the lateral recess of Reichert or Luschka's foramen on one or both sides may be caused by tumors of the lateral lobes of the cerebellum, arachnoiditis localized in the lateral angle of the ventricle, or choroiditis. Hydrocephalus may cause enlargement of the ventricle without particularly changing its shape. Arachnoiditis sometimes changes the shape of the ventricle so that it cannot be recognized.

The article is very profusely illustrated with roentgenograms and diagrammatic sketches showing the form of the ventricle under normal conditions and various pathological conditions.

AUDREY GOSS MORGAN, M.D.

Balado, M.: Clinical and Roentgenological Anatomy of the Third Ventricle (*Anatomía clínica y radiológica del tercer ventrículo*). *Semana méd.*, 1931, xxviii, 413.

This article reports a study of the third ventricle in a living subject by means of the intraventricular injection of air and lipiodol.

From the point of view of neurological surgery, the form of this cavity is of extreme importance as a change renders possible the localization of nearby anatomopathological processes.

Ventriculography with air and lipiodol is harmless. It gives more constant results than the use of air alone as the lipiodol rarely escapes from the ventricles, fills certain angles with greater facility, and

outlines the ventricular system very clearly. The author knows of no disadvantages in its use. Because of the extreme difficulty of diagnosis in cranial surgery, he extends the indications to all cases of cerebral lesions requiring surgical treatment.

Following Dandy's technique, a puncture is made in one of the occipital horns of the cerebral ventricles, a portion of the cerebrospinal fluid is extracted, and 4 c.cm. of lipiodol are injected. During the injection, the patient rests face downward with the head on a slightly higher plane than the body and the feet on a lower plane in order to decrease the cranial pressure. Local anesthesia is employed. A horizontal incision is made following the line of the occipital curve until its median end is 3 cm. above and outside of the exterior occipital protuberance. All of the planes are incised down to the bone and an opening is then made with a trephine. The dura mater is raised by means of a needle and divided radially. The cerebral cortex of the occipital pole and the ventricular quadrant are punctured toward the upper edge of the ear. Thereupon the cerebrospinal fluid immediately gushes out of the end of the needle. The intraventricular pressure is measured by means of Claude's manometer. The cerebrospinal fluid is removed until the patient complains of pain in the orbital and frontal regions. The extracted fluid is then measured and 4 c.cm. of lipiodol are injected.

In cases of bilateral hydrocephalus the cerebrospinal fluid is removed easily and in abundance, 4 c.cm. of lipiodol are injected, and a half or a third of the extracted fluid is replaced by air.

When the ventricular cavities are slightly dilated, only lipiodol is injected.

When the ventricular cavities are narrow, the cerebrospinal fluid is gradually replaced by lipiodol.

Following the injection the patient is taken to the X-ray room and placed in ventral decubitus with the head elevated about 45 degrees. Roentgenograms are then taken with the principal ray passing through the anteroposterior axis of the skull.

The images obtained vary greatly in clearness according to the shape of the third ventricle. When the ventricle is narrow and the foramina are permeable, the image is perfect, but when the ventricle is dilated, the image is indistinct and the lipiodol does not pass below the obstruction.

WILLIAM W. WHITELOCK, PH.D.

Penfield, W.: The Classification of Brain Tumors and Its Practical Application. *Brit. M. J.*, 1931, i, 337.

The author classifies gliomata according to the developmental and pathological cell types into neuro-epitheliomata, multiform spongioblastomata, medulloblastomata, oligodendrogliomata, polar spongioblastomata, astroblastomata, astrocytomata, and ependymomata.

Neuro-epitheliomata. The tumors are characterized by the formation of neuro-epithelium, often in the shape of true rosettes. They are the medullo-

epitheliomata and neuro-epitheliomata of Bailey and Cushing.

Multiform spongioblastomata. Multiform spongioblastomata are common, rapidly growing tumors characterized by a variety of cell forms. They have been called gliosarcomata, glioblastomata, and multiform and polymorphous gliomata. They usually show small cells like apolar spongioblasts. The presence of Nissl's plump astrocytes and giant cells is characteristic. Most characteristic, however, are curious glomerulated out-buddings of the blood vessels, widely scattered areas of focal necroses, and small cysts.

Medulloblastomata. Medulloblastomata are the cellular tumors most frequently found in the cerebellum of the child. As the author was unable to find any neuroblasts in these tumors, he believes they are made up of apolar (migratory) spongioblasts instead of indifferent cells.

Oligodendrogliomata. Oligodendrogliomata are cellular neoplasms, but are much more differentiated than medulloblastomata. Their type of cell is not the oligodendroglia, but the more embryonic oligodendroblast. The cells are difficult to impregnate, but there may be pericellular halos quite easy to recognize and resembling the halos seen in acute swelling of oligodendrocytes in the brain. The tumors grow very slowly and often contain scattered areas of calcification. They are found in the cerebral hemispheres, where they infiltrate the brain in such a manner that no definite line of demarcation can be seen.

Polar spongioblastomata. Polar spongioblastomata are composed of elongated cells with tail-like expansions which may be mistaken for fibers. These tumors have been called neurinomata centrale or unipolar spongioblastomata. The cells are usually bipolar, but occasionally are unipolar or multipolar. Degeneration and cyst formation are frequent, but mitoses are rare. The neoplasms grow slowly and are most frequently encountered in the cerebellum.

Astroblastomata. Astroblastomata present a characteristic arrangement of cells about blood vessels and connective tissue septa. The nuclei leave a zone free about the vessel. Successful staining with silver discloses long vascular foot processes like the astroblasts in newborn mammals. These tumors grow moderately slowly, but may contain mitotic figures.

Astrocytomata. The author does not subdivide astrocytomata into fibrous and protoplasmic types as he has found them to contain neuroglia fibers. They rarely contain cells that resemble astrocytes of the nervous system. Instead, the type of cell is what Penfield calls the piloid astrocyte, which appears in the brain in old scars and in columnar sclerosis. Mitoses are rare, but the formation of large cysts is frequent. These are the most benign and the most common of all gliomata.

Ependymomata. Ependymomata are slowly growing tumors which are frequently difficult to remove because of their deep situation. Their histological

characteristic is the production of ependyma in rings or epithelial sheets. They frequently have their origin in the midline of the cerebellum. They are more common in the spinal cord than in the brain.

In general, the gliomata arising within the brain do not pass outward through the pia mater, and conversely, the tumors of the meninges and nerve sheaths arising within never pass outward through the pia mater.

The author divides the sheath tumors into three groups: (1) meningeal fibromata, (2) perineurial fibromata, and (3) neurofibromata.

The meningeal fibroblastomata, also known as dural endotheliomata, psammomata, meningiomata, and arachnoidal fibroblastomata, are attached to, and vascularized by, the dura. The histological structure most characteristic of these tumors is a whorl formation such as occurs in arachnoidal tufts. Meningeal fibroblastomata may invade the skull, causing bone thickening, but they do not enter the brain. These tumors grow slowly and may recur after many years if they are not completely removed.

Perineurial fibroblastomata arise from the connective tissue sheaths of nerves, particularly those of nerve roots. They develop most frequently from the sheath of the root of the eighth cranial nerve. Histologically, the nuclei tend to form characteristic palisades. These neoplasms do not metastasize, but they frequently degenerate and become necrotic at the center. They do not yield to X-ray treatment like gliomata.

Neurofibromata may appear on any nerve and are multiple. Histological examination shows nerve fibers running through these tumors, whereas in perineurial fibroblastomata the nerve fibers pass around the capsule. The treatment depends upon the location of the neoplasms. Neurofibromata may undergo sarcomatous change.

The author concludes that clinical judgment and therapeutic insight can be based only upon histological study.

ROBERT ZOLLINGER, M.D.

Globus, J. H.: Tumors of the Quadrigeminate Plate: A Clinico-Anatomical Study of Seven Cases. *Arch. Ophth.*, 1931, v, 418.

The author discusses briefly the important nervous structures in the region of the midbrain which is roofed by the quadrigeminate plate. Tumors in this region cause early compression of the narrow aqueduct of Sylvius with resulting obstructive hydrocephalus and signs of increased intracranial pressure. Symptoms of localizing value due to compression of the geniculate bodies, oculomotor and red nuclei, and pyramidal tracts usually follow in rapid succession. As a rule there are signs pointing to involvement of the neighboring cerebellum. Occasionally there are disturbances from distention of the floor of the third ventricle.

The author reports the clinical and autopsy findings in seven cases. In six cases death followed an unsuccessful attempt to remove the tumor by operation and in one case it followed lumbar punc-

ture performed shortly after the patient's admission to the hospital. Histological examination showed that the tumors arose from the pineal gland or embryonic rests of that organ.

LEO M. DAVIDOFF, M.D.

Heuer, G. J., and Vall, D. T., Jr.: Chronic Cisternal Arachnoiditis Producing Symptoms of Involvement of the Optic Nerves and Chiasm: Pathology and Results of Operative Treatment in Four Cases. *Arch. Ophth.*, 1931, v, 334.

Heuer and Vall call attention to a group of cases with rapid failure of vision, primary optic atrophy, and constriction, not characteristically bitemporal, of the visual fields. In the four cases they report in this article, operation revealed opacity and thickening of the leptomeninges over the cortex, a similar disturbance around the optic chiasm, adhesions around the optic nerves, and distention of the cisterna chiasmatis by cerebral fluid. No evidence of tumor was found in the chiasmal region in spite of careful search. After liberation of the adhesions and evacuation of the cisterna chiasmatis, remarkable improvement in visual acuity was noted while the patients were still in the hospital. The improvement was still maintained when the patients were last seen three years, one year, eleven months, and one and a half months after the operation.

The authors believe that the condition is a generalized process which produces symptoms when it becomes particularly marked in a given area—in their cases, the region of the chiasma—and that chronic cisternal arachnoiditis should be included among the conditions giving rise to the chiasmal syndrome.

LEO M. DAVIDOFF, M.D.

Martin, R. C.: Intratemporal Suture of the Facial Nerve. *Arch. Otolaryngol.*, 1931, xiii, 259.

For the relief of peripheral facial paralysis following mastoidectomy in which the nerve has been cut in the facial canal, anastomosis with the accessory or hypoglossal nerve has been performed. However, because of the consequent atrophy of the muscles supplied by these nerves and the new associated movements with the face and shoulder or the face and tongue, the results have not been entirely satisfactory. The best results are obtained by end-to-end intratemporal anastomosis of the facial nerve such as was first done successfully by Bunnell in 1927.

The diagnosis of section of a nerve is of extreme importance. Facial paralysis following mastoidectomy may be due to cutting or bruising of the nerve, hemorrhage, or exudates. Paralysis due to cutting appears as soon as the patient recovers from the effects of the anæsthetic. That due to hemorrhage may appear equally early. Paralysis due to bruising or to exudates appears usually within an hour or two after the operation.

The operation described is recommended only for nerves cut at a point distal to the geniculate ganglion. This site of section can be determined by

testing the taste sense of the tongue. To allow for spontaneous recovery, the operation for suture of the nerve should not be attempted until several months after healing of the mastoidectomy wound. The results of the suture are first noted about eight months later.

In conclusion the author says that this method may prove of value as a decompressive procedure in cases of Bell's palsy in which the patient fails to recover.

DAVID J. IMPASTATO, M.D.

PERIPHERAL NERVES

Cailliau, F.: The Anatomical Forms of von Recklinghausen's Disease (Les formes anatomiques de la maladie de Recklinghausen). *Ann. d'anat. path.*, 1930, vii, 107.

Following a review of the literature on Recklinghausen's disease, the author reports seven cases.

According to von Recklinghausen's original concept, the condition is a neoplasia of the perineurium with splitting of the bundles and substitution of neoplastic tissue for nerve fiber. Later the source of the tumors was considered to be the neurolemma cells. A similarity was noted between the disease and multiple meningiomas, cerebral glioma, and ganglioglioma. This similarity first suggested that von Recklinghausen's disease belongs to a group of neural dysgeneses, central as well as peripheral. A vascular sympathetic origin was suggested by a case of nodular periarteritis developing in a family with a history of von Recklinghausen's disease.

In the author's seven cases most of the tumors were apparently of vascular origin; at least the vessels were masked by fibrous elements.

In Case 1, the patient presented a pigmented dermal fibromatosis and pseudo-atrophic plaques. Most of the lesions had been present since birth. Many of them resembled vascular naevi. The violaceous depressed plaques gave way before the finger until a fibromatous foundation was reached. In addition to the skin lesions, examination revealed a cleft soft palate, a submaxillary ranula, and endocrine disturbances manifested by exophthalmos and hyperhidrosis. On the whole the histological structure of the tumors was that of highly vascular fibromata. No glial tissue was seen. The adventitia of the blood vessels was unusually thick. Though hair follicles were absent, sweat glands were present and staining was positive for elastin. Penetrating the tissue were normal axons with a neurolemma. Possible sources of the tumors were the vessel adventitia, the periglandular sheaths, and the neurolemma cells.

Case 2 was that of a subject who had had pigmented maculae since birth and had developed a multiple fibromatosis during the last two years. Definite evidence of acromegaly included the usual bone changes and enlargement of the sella. Biopsy suggested that the tumors were gliomata. As a rule the cells of peripheral gliomata divide longitudinally and actively, and their nuclei are more granular than those of the central tumors. The tumors in this case

resembled central gliomata in lacking these two characteristics and also myelin. In places, the blood vessels formed telangiectatic groups and showed thick walls and many-layered endothelium. The gliosis about the vascular lesions resembled the splenic capsule about the splenic vessels.

In Case 3 the subject was mentally deficient and presented pigmented tumors. Biopsy showed the tumors to be gliomata of the small-celled type with few fibers. As in central gliomata, myelin was absent.

In Case 4, which clinically resembled von Recklinghausen's disease, biopsy suggested that the tumors were formed from neuron elements. Besides a few normal nerves, masses of myelinated or unmyelinated axons and masses of neurolemma elements were present. The vessels showed only one endothelial layer and were nearly normal. Collagenous staining was marked, and the fibrous capsule was unusually heavy, suggesting necrosis of neural tissue and fibrous repair.

In Case 5, the microscopic sections resembled those of sympathetic gangliogliomata. Among numerous ordinary collagenous fibers were ganglion cells and unmyelinated axons. The vascular changes were important. The many-layered endothelium and the other tunics were infiltrated with glial cells, suggesting that the tumors may have arisen from the vascular sympathetics.

In Case 6 the clinical picture resembled that of von Recklinghausen's disease, but the microscopic findings suggested gliosarcoma. However, a vascular origin of the tumors could not be excluded.

Case 7 was not typical clinically. The lesions were only multiple pigmented naevi. Biopsy revealed a matrix of neurolemma elements and a few axon- or dendron-bearing cells. In places there were cellular masses giving the cholesterol reactions for xanthoma. These cells were reticulated as are Gaucher's cells or the cells in the peritubercular spaces of the liver.

CURTIS NELSON, M.D.

Cornil, L., and Raileanu, G.: Hyperplastic and Progressive Schwannosis (La schwannose hyperplastique et progressive). *Ann. d'anat. path.*, 1931, viii, 39.

The authors describe in detail the histological findings in a case of progressive hyperplastic schwannosis. This disease was described clinically in 1893 by Dejerine and Sottas under the name "interstitial progressive neuritis of childhood," and is one of the forms of progressive hypertrophic neuritis. In the author's case it began at the age of eighteen years. Both the upper and the lower limbs showed amyotrophy. There was no hereditary or familial history suggesting the condition. The predominating lesions in the nerve trunks were in Schwann's cells. The myelin content had degenerated, and the cells had begun to proliferate around the axis cylinders. Some of the axis cylinders showed ordinary secondary changes. The interstitial tissue and the vessels were not actively involved in the degenerative process.

The essential character of the lesion is its exclusive involvement of Schwann's cells. The proliferation of the Schwann cells seems to result from the loss of myelin. The cells hypertrophy in an effort to supply the lack of myelin, but the restoration is not sufficient and the axis cylinders undergo secondary degeneration.

The authors suggest calling the condition "progressive hyperplastic schwannosis" to differentiate it from schwannitis and schwannomata.

AUDREY G. MORGAN, M.D.

MISCELLANEOUS

Dimitri, V.: Acute Ascending Paralysis (Parálisis ascendente aguda). *Rev. de especialidades, Asoc. med. argent.*, 1930, v, 1186.

The author reports three cases of acute ascending paralysis (Landry's paralysis). In the first case, that of a man sixty-five years of age who gave a history of syphilis, autopsy showed serious lesions of the medulla and pons, but no involvement of the peripheral nerves or the higher parts of the cerebrum. Both hæmorrhage and acute cell degeneration were found. The chronic process on which the acute one developed was a meningomyelitis probably due to syphilis.

The second case was that of a man fifty-eight years of age who was an alcohol addict. This case shows that there is a close relationship between certain forms of Landry's paralysis and Wernicke's superior hæmorrhagic polio-encephalitis. Severe ocular paralysis was caused by hæmorrhage and cell degeneration in the central nervous system.

In the third case, that of a man forty years of age, the condition was evidently the result of diphtheria followed by polyneuritis. The diphtheria was treated intensively with serum. The subsequent polyneuritis seemed to be decreasing, but after a few days in which nervous phenomena were absent acute symptoms developed suddenly and were soon followed by death.

These cases demonstrate that chronic intoxication, particularly alcoholism, favors the causation of acute symptoms by any new toxi-infectious agent. The pathological lesions vary in different cases, but are predominantly in the medulla. In two of the cases reported the brain changes were not marked, but such changes must be taken into consideration in the interpretation of the clinical picture. As neither clinical observations nor histological examination shows the exact nature of the disease, this remains to be determined by experimental inoculation.

AUDREY GOSS MORGAN, M.D.

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principles as laid down by Halstead, Meyer, and Handley for the treatment of breast carcinoma.

ALTON OCHSNER, M.D.

Keynes, G.: The Radium Treatment of Primary Carcinoma of the Breast. *Edinburgh M. J.*, 1931, xxxviii, 19.

Keynes states that X-ray irradiation has been thoroughly tried and found wanting in the treatment of malignancy. He believes that very few would advocate its use for primary carcinoma. Radium therapy of tumors is of three types: (1) surface irradiation, in which the radium is placed at a measured distance from the skin on Columbia paste, (2) irradiation by the bomb method, and (3) interstitial irradiation, in which platinum needles containing the radium are introduced into the tissues. The author prefers interstitial irradiation.

At St. Bartholomew's Hospital, London, interstitial irradiation was first used in the treatment of primary carcinoma of the breast in August, 1924. The technique of inserting the needles is described. The standard period of irradiation is seven days.

The author reviews 138 cases of primary carcinoma of the breast which were treated with radium. Of the 95 patients with an operable tumor, 81 were still alive and no fewer than 45 were free from signs of the disease in 1930. Of the 40 patients with an inoperable tumor, 23 have survived for periods up to more than six years and only 6 have any discoverable signs of a tumor.

A tumor which is ulcerating before treatment usually heals up rapidly after irradiation with correct dosage. The malignant cells are destroyed and the normal cells are left. The disappearance of the tumor is not immediate. Frequently the full results of the treatment are not obtained until after from four to five months.

In some of the cases reviewed the breast was removed for various reasons after the radium treatment. On histological examination the tumor mass was found replaced by fibrous tissue. In 1 specimen, however, some carcinoma cells remained. One patient went through a normal pregnancy after the radium treatment and shows no evidence of recurrence one and a half years after delivery. The author regards pregnancy as a crucial physiological test of the efficacy of radium treatment.

EARL O. LATIMER, M.D.

TRACHEA, LUNGS, AND PLEURA

Steinberg, I. R., and Passalacqua, H. A.: Hernia of the Mediastinum from Artificial Pneumothorax (Hernia del mediastino por neumotórax artificial). *Semana med.*, 1931, xxxviii, 152.

There are two cul-de-sac in the mediastinum, one anterior and superior, which, in the fetus, is filled by the thymus, and one posterior and inferior between the descending aorta and the heart. These are weak points which, under the pressure of the gas insufflated in the induction of artificial pneumo-

thorax, may herniate into the opposite side. In the majority of cases the hernia occurs in the upper anterior cul-de-sac. While the formation of such hernia is favored especially by positive pressure, in one of the authors' cases the pressure had always been negative. The hernia generally appears within a year after the induction of the pneumothorax.

The pneumatocele is generally not suspected unless a roentgenogram is taken. When it is quite large it may cause a syndrome of pneumothorax in the upper parasternal region on the side opposite the one treated. This syndrome is characterized by dyspnea, a decrease or abolition of vocal fremitus, tympanism, a decrease or abolition of breath sounds, and an amphoric sound. Sergent describes rales at the hilar region on the side opposite the pneumothorax. There are no characteristic subjective symptoms.

The roentgenogram shows a clear zone in the upper parasternal region of the side opposite the pneumothorax, which is surrounded by a dark line with its concavity directed toward the mediastinum. The hernia is visible during expiration, particularly when expiration is forced, and disappears or decreases during inspiration. The pneumothorax treatment need not be stopped on account of the hernia, but positive pressure should be avoided and the collapse maintained with low pressures. Air should not be withdrawn, but the time between insufflations should be increased.

AUDREY GOSS MORGAN, M.D.

Bull, P.: Thoracoplasty in the Treatment of Pulmonary Tuberculosis. *Acta chirurg. Scand.*, 1931, lxxi, 553.

From the results of his study of thoracoplasty in the treatment of pulmonary tuberculosis the author draws the following conclusions:

1. Patients with unilateral or practically unilateral pulmonary tuberculosis, in whom artificial pneumothorax cannot be induced or does not yield the desired results, may be cured by complete or partial extrapleural thoracoplasty alone or combined with pneumothorax or exeresis of the phrenic nerve.

2. The operation should be undertaken only after the physician in charge of the case has been able to form a definite opinion on the prognosis from a considerable period of observation.

3. The operation can be performed only if the other lung shows no clinical evidence of tuberculosis or shows only slight and stationary signs of the condition.

4. Extrapleural thoracoplasty is carried out through a paravertebral incision, with resection of the ribs, from the eleventh or tenth to the first, inclusive.

5. The resection of the ribs must be done as far back as possible—right up to the transverse processes of the vertebrae.

6. The two-stage operation has a lower mortality than the one-stage operation.

7. The operation does not cause noteworthy permanent discomfort.

8. The choice between a local and general anæsthetic does not seem to affect the results appreciably.

9. Thoracoplasty is indicated when improvement has not followed sanatorium treatment for three or four months and artificial pneumothorax cannot be induced with success.

10. Recurrent hæmoptysis constitutes an additional indication for the operation.

11. Chronic cavities as large as, or larger than a walnut heal more rapidly and surely after operation than after expectant treatment.

12. If a cavity does not collapse completely after thoracoplasty it may be made to collapse by pneumolysis and the use of a fat graft or a paraffin filling, plugging with tampons, or drainage.

13. The chronic productive forms of pulmonary tuberculosis are best suited to thoracoplasty. In the purely exudative forms operation is dangerous.

14. From 35 to 45 per cent of patients who cannot be saved by other means are rendered fully fit for work by thoracoplasty.

15. About 20 per cent are benefited by the operation, but ultimately die of tuberculosis.

16. About 16 per cent derive no benefit from the operation.

17. About 6 per cent die as the result of the operation, i.e., within eight weeks.

18. All sanatorium physicians and general practitioners should know the indications for, and the results of extrapleural thoracoplasty.

Maurer, A.: Thoracoplasty in the Treatment of Pulmonary Tuberculosis (*La thoracoplastie dans le traitement de la tuberculose pulmonaire*). *J. de chir.*, 1930, xxxvi, 857

The indications for thoracoplasty are pulmonary and pleural. The one pulmonary indication is a lesion which will at some time threaten life. The operation is contra-indicated by bilateral pulmonary lesions unless the lesions in one lung have remained inactive for several months. It is contra-indicated also by active ulcerocaseous tuberculosis and, with the exception of the larynx, the involvement of another organ besides the lung by active tuberculosis. Persons with emphysema or sclerosis of the sounder side, marked cachexia, and obesity are questionable risks. Contra-indications presented by the pleural cavity are a pleural effusion complicating an artificial pneumothorax, a purulent effusion with perforation of the lung during artificial pneumothorax or oleothorax, and pleural fistula with or without perforation of the lung. In cases of pleural effusion complicating pneumothorax the pleural effusion should be drained by repeated punctures or, if there is marked infection, by pleurotomy. However, pleurotomy should be deferred as long as possible. In perforation of the lung into an oleothorax or artificial pneumothorax the choice of time for thoracoplasty is difficult because the exudate may subside after repeated punctures or may later produce adhesions rendering thoracoplasty ineffective. In cases of pleural fistula complicating

perforation of the lung, pleurotomy in a dependent part of the cavity may be done before thoracoplasty.

With regard to the technique of thoracoplasty, it is emphasized that resection of the ribs posteriorly at the costotransverse articulation gives greater collapse of the lung than resection of the same length of ribs anteriorly. Local anæsthesia should be employed for the operation.

The author describes the technique of an upper paravertebral thoracoplasty, a more extensive thoracoplasty with resection of the transverse processes and juxtavertebral segments of the ribs, a more extensive thoracoplasty with resection of the anterior costal arcs, and inferior paravertebral thoracoplasty.

1. *Upper paravertebral thoracoplasty.* As a rule the first to sixth ribs are resected. The subject usually lies on the sound side with a pillow under the lower ribs and the elbow of the diseased side on a pillow in front of the chest to bring the scapula forward. However, a subject liable to attacks of productive coughing sits up with his head against a support to prevent the extrance of exudate into the bronchi of the sound side. The incision is made from a point half way between the scapular spine and the nearest spinous process to a point halfway between the scapular angle and the nearest spinous process. After section of the iliocostalis insertions, the sacrospinalis is retracted toward the spine. The costotransverse articulation is separated and the rib is sectioned posteriorly at this articulation and anteriorly as far as it is exposed or as is indicated by the size of the lesion. The first rib is sectioned first anteriorly 2 or 3 cm. from the costotransverse articulation with avoidance of the eighth cervical and first thoracic nerves and the thyrocervical trunk and then severed posteriorly at the articulation.

2. *Thoracoplasty with resection of the transverse processes and juxtavertebral segments of ribs.* In the removal of the transverse processes and the first to sixth ribs, the sacrospinalis muscle is retracted from the transverse processes which are first separated from the ribs and divided at the base with a chisel. The rib is then divided opposite the base of the process posteriorly and severed anteriorly as far as is indicated by the lesion unless the rib has been removed in a previous operation.

3. *Thoracoplasty with resection of anterior arcs of ribs.* As a rule the first to sixth ribs are resected. With the subject on his back, the incision is made along the lateral side of the pectoralis major. The ribs are resected from the lateral border of the pectoralis minor to the serratus anterior. If this operation has been preceded by thoracoplasty of the first type, all of the anterior portion of the ribs may be removed from the costochondral junction anteriorly to its previously divided end posteriorly. For resection of the first or second ribs the tendon of the pectoralis minor is divided and the axillary veins are retracted. Resection of the first rib materially increases the risk, but permits greater apical collapse

4. *The lower paravertebral thoracoplasty.* The sixth or seventh to the eleventh ribs are usually resected. The technique is similar to that of the thoracoplasty of the second type except that the incision ends at a point from 10 to 12 cm. from the spine on the eleventh rib.

The resections should be proportionate to the lesions. A partial resection of Type 1 (fewer than five or six ribs) is suitable for a small apical cavity, and a partial resection of Types 1 and 3 is indicated for a large cavity with only slight suppuration. Resection of Type 2 is indicated for lesions near the posterior mediastinum, and resection of Types 1 and 4 for complete involvement of the lung or a large cavity with a fluid level. The stages of the operation should not be separated by more than fifteen days as longer intervals favor the formation of harmful calcifications.

Stability of the shoulder should be always kept in mind. The levator scapulae should be carefully guarded in all incisions at the level of the spine of the scapula, the rhomboids should be divided at a sufficient distance from the scapula to allow good closure, and if the pectoralis minor has been divided it should be carefully resutured.

In 54 cases in which 105 thoracoplasties were done there were 4 deaths. One occurred three days after the operation from generalized tuberculosis on the side operated upon, 1 from acute nephritis, 1 from hæmoptysis, and 1 from pulmonary embolism. There were no deaths from shock.

CURTIS NELSON, M.D.

Carter, B. N.: *Thoracoplasty as a Method of Treatment in Pulmonary Tuberculosis: Report of Fifty-Three Cases.* *Arch. Surg.*, 1931, xlii, 289.

The author reports fifty-three cases of pulmonary tuberculosis which were treated by thoracoplasty in the last six years. In 45, the operation was performed in 2 stages, and in 8, in 3 stages. In 3, only 1 stage has been completed. Forty-four (83.01 per cent) of the patients are still alive. The results in the 53 cases are summarized in a table. The term "apparently well," which is used in this table, means that the sputum is negative for tubercle bacilli and the patient is free from cough and able to lead a normal life. The term "improved" means that the sputum is occasionally positive for tubercle bacilli, but the patient has gained weight and strength and is able to be up and about.

Of the 9 deaths, 3 were due to the operation and 6 occurred some time after the operation. Of the 6 patients who survived the operation and died later, 2 were extremely poor risks and probably should not have been subjected to operation, 2 died of generalized tuberculosis, and 2 died of extension of the disease to the other lung. Of the 3 patients whose deaths may be attributed to the operation, 1 died of mediastinal flutter, 1 as the result of a transfusion and infection of the wound, and 1 from a cause which was not determined.

J. FRANK DOUGHTY, M.D.

Nanu-Muscel, I., and Stoichitza, N.: *A Contribution to the Study of Lung Abscess (Contribution à l'étude des abcès pulmonaires).* *Arch. med.-chir. de l'appar. respir.*, 1930, v, 295.

Laënnec was the first to recognize abscess as an entity among pulmonary diseases. He regarded it as an extremely rare lesion. He and his immediate followers recognized only the acute post-pneumonic and metastatic abscess and failed to recognize the chronic abscess. The prognosis of pulmonary abscesses was formerly regarded as extremely grave and spontaneous cure was believed to be extremely doubtful. With the advent of X-ray examination it appeared at first that interlobar pleurisy was more frequent than lung abscess, but it is now known that lung abscess is not rare and that its prognosis is less unfavorable than was formerly believed.

The frequency of pulmonary abscess has increased during the great epidemics of grippé. Hence Letulle and Bezançon accord a very important rôle to grippé as a causative condition. In Anglo-Saxon countries a greater frequency of pulmonary abscess has been noted with the increasing frequency of tonsillectomy performed under general anesthesia. With improvement in the diagnosis it appears that interlobar pleurisy is becoming more and more infrequent as compared with lung abscess. In 383 autopsies Sergeant, Durand, and Kourilsky found only 2 cases of serofibrinous interlobar pleurisy, and in 1,000 autopsies, Lermier found no case of this condition. Rist considers interlobar empyema as an extreme rarity. On the other hand, certain surgeons, particularly Paiseau and Solomon, insist that the roentgen picture of this condition is quite distinct from that of true pulmonary abscess. In abscess of the lung the roentgenogram usually shows an oval cavity with its long axis vertical which, above, is filled with air and below shows an obscure zone with a definite fluid level. Sometimes these findings are multiple. Occasionally there is found, instead of the typical picture, a more or less dense homogeneous shadow which is not sharply circumscribed and in which it is impossible to perceive any clear area. It has been estimated that the latter picture is noted in about 20 per cent of the cases. It was thought that the use of lipiodol might facilitate the diagnosis in cases lacking the characteristic picture, but it has been repeatedly found that lipiodol introduced into the bronchial tree stops sharply at the periphery of the abscess.

American surgeons have used the bronchoscope with increasing frequency for both diagnosis and drainage.

The authors are uncertain whether the abscesses are due to the bronchial spread of infection or are caused by emboli. They cite the discussion among American surgeons with regard to the manner in which pulmonary abscesses are formed after tonsillectomy. According to some, they are the result of the aspiration of septic material, and according to others they are formed by emboli. Both theories are supported by experimental data.

There is lack of agreement also regarding the causative organisms. Bezançon and Lemierre regard chronic fœtid abscesses as a chronic form of pulmonary gangrene with exacerbations and remissions which is due to a special spirochæte. Sergeant, on the other hand, and the majority of American surgeons place all fœtid suppurations in the group with abscesses and ascribe their chronic evolution and fœtid character to various spirilla.

Certain abscesses of the lung will heal spontaneously or under simple medical treatment, while another group will cause death in spite of treatment. The division between acute and chronic abscesses seems to be important from the standpoint of therapeutics. As a rule, acute abscesses should be treated medically and chronic abscesses surgically. The medical methods include vaccine therapy, chemotherapy, and postural drainage. Each has its proponents. None is completely efficacious. Recently, emetin has been advocated even for non-amebic abscesses. If medical treatment gives no results in two months, surgery is indicated.

In cases of well-localized abscesses surrounded by only slight parenchymatous condensation and extending to the cortex the only direct method of treatment is pneumotomy. Archibald reported good results from this procedure in 60 per cent of 70 cases, and Miller and Laubert obtained good results with it in 80 per cent of 20 cases. Some surgeons have advocated the use of artificial pneumothorax, but this treatment is associated with grave danger and is strongly condemned by Sergeant because if adhesions are torn near the abscess a very serious pyopneumothorax may result. More recently, the use of the bronchoscope with aspiration has been advocated and has been practiced widely in the United States. Numerous cures from such treatment have been reported from various clinics.

In chronic abscess, radical surgery offers the only hope of obtaining a cure. When no treatment or only palliative treatment is given the mortality after three or four years ranges from 60 to 80 per cent. American surgeons advocate lobectomy. Graham performs lobectomy in stages with the actual cautery and Archibald performs it with the electro-cautery. The mortality of both of these methods is considerably lower than that of lobectomy performed with the knife. The operative mortality is reduced also by proper selection of the time for the operation. The best time seems to be between two and two and a half months after the onset of the illness.

The authors report 20 cases of lung abscess. In 70 per cent the abscess occurred in the right lung. In 80 per cent the onset was sudden. In 90 per cent there was fœtid expectoration. In almost every instance the fœtid expectoration developed in the first two weeks of the illness. The characteristic roentgen picture showing a fluid level was found in 70 per cent. In 4 cases a cure followed symptomatic medical treatment. Of 6 cases in which emetin was used, improvement resulted in 3. There were 5 deaths. Two of the deaths were due to generalized

infection, 2 were the result of pyopneumothorax caused by the rupture of adhesions during treatment by artificial pneumothorax, and 1 occurred a few hours after pneumotomy. The patient who died after pneumotomy was not operated upon until the fourth month of the disease and was in very poor condition. Another patient subjected to this operation was completely cured.

The authors believe that age may play a part in determining whether or not an abscess will go on to chronicity or to cure under medical treatment.

FRANK D. BERRY, M.D.

Heuer, G. J.: The Etiology and Treatment of Pulmonary Abscess. *Surg., Gynec. & Obst.*, 1931, lii, 394.

Common clinical conditions preceding pulmonary abscess are wounds of the lungs, acute respiratory infections, the aspiration of a foreign body, malignancy of the œsophagus, bronchi, or lungs, septicaemia, peritonitis, hepatic and subphrenic abscess, and surgical operations. The infecting organism may enter the lung by direct implantation, by inhalation or aspiration, by septic embolism, or by lymphatic extension. The predominating infecting organisms found in pulmonary abscess may be the oral anaerobes present in the sputum, the bacillus melanogenicum, the bacillus fusiformis, spirochæte, the streptococcus viridans, the streptococcus hæmolyticus, or pyogenic cocci. Other factors which play a part in the production of pulmonary abscess are the virulence-resistance ratio, interference with the blood supply of the lung, and bronchial obstruction.

In the treatment of pulmonary abscess free drainage is exceedingly important. Non-surgical drainage may be achieved by the postural method or the bronchoscopic method. In cases in which the condition is due to organisms commonly found in the mouth the intravenous administration of an arsenical preparation or vaccine therapy may give favorable results. If definite improvement does not follow, surgical drainage is indicated, especially when there is a single peripheral abscess. To collapse abscess cavities which drain freely into a bronchus artificial pneumothorax may be used. Phrenicotomy is of most value in cases of abscess of a lower lobe. In cases of chronic multiple lung abscesses in which artificial pneumothorax is impossible because of adhesions, thoracoplasty may be done. Cautery pneumectomy by the method of Graham, and lobectomy are to be considered only in the most refractory chronic cases.

J. DANIEL WILLEMS, M.D.

Sergeant, Kourilsky, and Poumeau-Delille: Some Thoughts on the Methods of Cure of Abscess of the Lung (Quelques réflexions sur le mode de guérison des abcès du poulmon). *Arch. méd.-chir. de l'appar. respir.*, 1930, v, 313.

Abscess of the lung may become cured spontaneously, by medical methods, or by surgery. Spontaneous cure occurs chiefly in simple abscesses due to

the pneumococcus or streptococcus. In cases of foetid abscesses spontaneous cure is exceptional. Medical cure may be more apparent than real. The use of emetin does not cause such rapid improvement as in cases of amœbic abscesses and almost always results in an incomplete cure. Medical treatment often produces a false cure with more or less latent sequelæ.

The authors believe that operation is indicated when the abscess becomes chronic and resists non-surgical treatment and should not be delayed more than two and a half months after the onset of the suppuration. Pneumotomy is sufficient for superficial and more recent collections, but partial pneumectomy is necessary for older and deeper processes.

FRANK B. BERRY, M.D.

Hedblom, C. A.: The Pathogenesis, Diagnosis, and Treatment of Bronchiectasis. *Surg., Gynec. & Obst.*, 1931, lii, 406.

Bronchiectasis may be unilateral or bilateral, congenital or acquired. In the congenital cases symptoms develop only after secondary infection. The dilating force may be the atmospheric pressure in the presence of reduced intrapleural pressure, extra-bronchial tension of fibrous tissue, or both. No dilating effect results from cough in the expiratory phase when the glottis is closed.

The characteristic syndrome of bronchiectasis is a chronic cough with purulent sputum and râles over the base of the involved lung. Roentgenograms may show only slight abnormalities, but a positive bronchogram made with a contrast medium will demonstrate conclusively the site, extent, and type of the lesion.

The process of bronchial dilatation is promptly arrested by early collapse therapy. Partial pulmonary collapse is obtained by phrenic neurectomy, partial pneumothorax, or circumscribed thoracoplasty. Complete collapse requires complete pneumothorax or thoracoplasty. Phrenic neurectomy is the method of choice in early cases. If this is not sufficient, a series of graded operations is indicated. Lobectomy and cautery extirpation or eradication should be reserved for advanced extensive lesions. The best results may be expected from compression treatment in incipient cases, the early diagnosis of which is made possible by bronchoscopy with the use of a medium.

J. DANIEL WILLEMS, M.D.

Lockwood, A. L.: Fundamental Principles in the Treatment of Acute Empyema. *Surg., Gynec. & Obst.*, 1931, lii, 386.

As a result of the extraordinary development of thoracic surgery during the war, the mortality of acute empyema has been reduced from 50 per cent or higher to almost nil in uncomplicated cases.

Emergency operations on patients who are dangerously ill are now unjustifiable unless the fluid pressure is so great that respiratory and cardiac functions are seriously impeded. The fluid is at first a protective mechanism which splints the lung and

stabilizes the mediastinum. Diagnostic aspiration should not be done if satisfactory roentgenograms are obtainable. The removal of the fluid should be delayed until the empyema is well walled off and the lung about it is firmly adherent to the chest wall.

The patient's general resistance should be maintained by forced fluids and food of high caloric value, and acidosis should be prevented by the use of alkalies and sugar. In streptococcus empyema antitoxin is of value.

Streptococcus bronchopneumonia extends over a period of weeks. The effusion occurs early, when the patient is most seriously ill. Pneumococcus infection is limited to a period of days and terminates by crisis. Drainage may be undertaken a few days after the crisis. In streptococcus empyema there may be so much fluid that dyspnoea becomes intense, necessitating repeated aspirations for relief. As a rule, drainage should be delayed until the fluid is purulent.

The treatment should be conservative and should be planned to prevent pneumothorax. The procedure should be aspiration, closed drainage by the trocar and cannula method, Carrel-Dakin treatment through the tube, and later, if necessary, incision or wide rib resection. Repeated short operations within the limits of the patient's resistance are based on sound judgment.

In Lockwood's cases the average mortality has been 12 per cent and the condition has gone on to the chronic stage in only 2 per cent.

J. DANIEL WILLEMS, M.D.

Gohrbandt, P.: Experimental Studies on the Production of Pleural Adhesions (Experimentelle Studien zur Erzeugung von Pleuraverwachsungen). *Deutsche Ztschr. f. Chir.*, 1930, cccxix, 89.

Operative approach to abscess or gangrene of the lung by the transpleural route is no longer so dangerous since the artificial production of adhesions between the costal and pulmonary pleuræ permits approach to the disease focus through the obliterated space. The introduction of a mass of paraffin extrapleurally above the diseased area of the lung by the Sauerbruch method has proved to be the best procedure. The approach to the diseased lung is hereby shut off completely from the remainder of the pleural cavity. At a second operation the lung tissue may be entered and the pus drained. The injected mass is beneficial also in that it exerts compression causing local collapse of the lung. Since a safe method of approach to intrathoracic suppurations, bronchiectasis, cysts, and solid new-growths has been found, these conditions may be brought within the scope of surgical treatment without special hazard.

To determine the possibility of producing pleural adhesions artificially, the author performed experiments on goats, dogs, and rabbits, using various substances such as paraffin, silk, rubber, and laminaria. The foreign material induced an inflam-

matory reaction with fibrin formation. The two layers of the pleura become fastened together by the fibrinous adhesions and the latter soon become organized into connective tissue. The mechanical effect of the foreign mass depends upon compression of the two serous surfaces and immobilizes the lung. Frequently phrenicotomy improves the results. The experiments showed that paraffin is much superior to all other materials for this purpose. Silk and rubber cause severe irritation and are too injurious to the tissues. Silk becomes so firmly embedded in the tissues that its removal is difficult. Laminaria, by its absorption of fluids and swelling, may cause a pressure necrosis. Even when paraffin is employed, difficulty arises frequently from collections of fluid in the bed of the foreign body, infection, pressure necrosis, and symptoms of displacement within the chest. However, with careful technique these unfavorable results may be avoided. Under the influence of the paraffin, the pus is often coughed up through the bronchus and the pulmonary abscess is emptied. Spontaneous cure may result also from rupture of the pus into the bed of the foreign mass.

A. MEYER (Z).

HEART AND PERICARDIUM

Fischer, H.: The Importance of Cardiolytic Therapy (Die Bedeutung der Kardiolyse fuer die Therapie). *Fortschr. d. Therap.*, 1930, vi, 557.

There are three forms of inflammatory pericardial changes which require various operative procedures to restore the cardiac function

1. If adhesions to the pericardium and the surrounding mediastinum occur without scar formation, the bands may produce various subjective

cardiac symptoms, such as a sticking in the region of the heart, especially on inspiration, the cause of which can be recognized roentgenologically. Division of the bands may effect a cure.

2. If there is a cicatricial mediastinopericarditis, there are, according to Volhard, two types of adhesion. In one, the cicatrix is chiefly about the pericardium and the heart is embarrassed mainly in systole. In addition to general signs of circulatory weakness there are systolic retractions and pronounced diastolic jerking of the chest wall. In these cases the Brauer cardiolytic, better called "thoracolytic præcordiaca," serves excellently. The third to the sixth or seventh ribs are removed over an extent of 10 cm., corresponding to the left half of the sternum. The periosteum is also removed. This window in the chest wall suffices to relieve the heart.

3. If there is cicatricial inclusion of the heart which interferes with both systole and diastole, release of the heart as described by Delorme is indicated. This procedure has been followed successfully by Kelm, Sauerbruch, and Schmieden. Dangerous complications of the operation are heart flutter and scars which extend into the heart muscle so that the myocardium is not recognizable. The operation is best started on the more powerful left ventricle as the weaker degenerated right ventricle may balloon out after its release and lead to fatal disturbance of the cardiac action. These and similar complications warn the surgeon to be guided by the operative findings and not to plan too extensive a decortication. The practitioner should refer the patients for operative treatment early, before the heart muscle has become entirely degenerated.

BUETTNER (Z).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Wolfsoln, G.: *Pneumococcus Peritonitis* (Ueber Pneumokokkenperitonitis). *Zentralbl. f. Chir.*, 1930, p. 2342.

With regard to the choice of the time for operation in pneumococcus peritonitis, only this is certain: the results of incision of the abscess are considerably better than those of operation in the acute stage. The frequent performance of operation in the acute stage is due to the difficulty in differentiating the syndrome of pneumococcus peritonitis from that of other conditions, particularly acute appendicitis. On the basis of a series of seven cases which he reported in 1925, the author recommended operation in the acute stage because the risk associated with delay at that time seemed to him to be too great. However, with more experience, he has noted progress in the diagnosis of the condition. Of a new series of seven cases which he saw in the years from 1926 to 1930, the diagnosis could be established in four. In two of these four cases it could be established with certainty, and in two with great probability. In one of the other cases operation was done for supposed acute appendicitis, and in another for supposed abscess in the pouch of Douglas following abortion. In the last case the patient entered the hospital in a moribund condition. Of the seven cases reported by the author in 1925, the correct diagnosis was not made in one.

The symptoms of pneumococcus peritonitis are still too infrequently recognized. At the onset of the condition, just as in acute appendicitis, there is often a prodromal stage of two or three days which is characterized by a catarrhal state of the nasopharynx and bronchi. Pneumonia is not among the manifestations. The patients are usually children under fourteen years of age. As a rule the illness appears to be more severe than appendicitis. There is a disproportionately high temperature (from 39 to 40 degrees C.). Herpes labialis is frequent. In acute shock the pulse becomes smaller, more rapid, and often more fleeting than in acute appendicitis. Palpation reveals, instead of the findings typical of appendicitis, a doughy swelling of the entire abdomen with marked meteorism and diffuse areas of tenderness and, as a rule, only moderate muscular defense. Diarrhoea usually begins on the second or third day. Pneumococci may be demonstrated directly in smears of the fluid obtained by puncture. (The author has never employed this method.) The demonstration of pneumococci in the vulval and vaginal secretions is of some value, but the demonstration of these organisms in the nasopharynx is not of importance. The blood picture on the whole resembles that of appendicitis.

If the diagnosis is certain, operation should be delayed as the mortality of late operations is lower than that of operations performed in the acute stage. The resistance seems to be extraordinarily lowered by the first onslaught of the pneumococcus. A certain percentage of the patients will die during the first three or four days of the acute stage whether they are operated upon or not. Therefore, in the compilation of statistics, the figures for the acute stage should be treated separately, certainly not with those for the stage of formed abscess. If the diagnosis can be established with certainty, the author advises waiting, but if it is not certain, early laparotomy is advisable.

Fourteen short case histories are appended.

A. STAFF (Z).

Jeffries, J. W.: *Torsion of the Great Omentum*. *Ann. Surg.*, 1931, cxlii, 761.

The author states that epiploitis due to torsion of the omentum is not rare. He reports four cases in which the diagnosis was not made until operation was performed. He emphasizes the importance of bearing torsion of the omentum in mind in the diagnosis of acute abdominal disturbances occurring in males with pre-existing inguinal hernia and a leucocyte count too low for acute appendicitis. The condition is usually diagnosed as acute cholecystitis or appendicitis. The symptoms are early pain in the right iliac fossa and the presence of a tumor mass. There is little nausea or vomiting, and little change in the pulse or temperature.

The author reviews the various theories as to the cause of the torsion. In his opinion, the condition is due to adhesions of the tip of the omentum and exaggeration of normal movements.

M. HERBERT BARKER, M.D.

Leonard, M.: *Tuberculosis in the Mesenteric Lymph Nodes in Children*. *Am. J. Dis. Child.*, 1931, xli, 573.

To determine the incidence of tuberculosis in the mesenteric lymph nodes of children and the association of this condition with other localizations of the disease, the author reviewed the autopsy records of all children under fifteen years of age who died of any cause in the New Haven, Connecticut, Hospital during a period of thirteen years.

Fifty of 161 complete autopsies showed anatomical evidence of tuberculosis in 1 or more tissues of the body. Evidence of tuberculosis of the mesenteric lymph nodes was found in 45 cases. In 27 of the latter, the nodes presented only caseation; in 11, both caseation and calcification; and in 7, only calcification. Five of the 18 cases showing calcification of the nodes were those of children under two

years of age. In 18 cases, tuberculosis of the mesenteric nodes was the only demonstrable tuberculous infection of the body.

These findings suggest that the intestinal lymphatic system plays an important rôle in tuberculous infection in childhood.

GEORGE A. COLLETT, M.D.

GASTRO-INTESTINAL TRACT

Alvarez, W. C.: Puzzling Types of Indigestion. *New Orleans M. & S. J.*, 1931, lxxxiii, 515.

This article is an analysis of the diagnoses made in 500 cases of indigestion or abdominal discomfort. The study was made with the idea of mapping out the areas in which clinical research is most needed.

In 175, or 1 out of 3 cases, there was organic disease of the digestive tract. In 52 cases the cause of the symptoms was organic disease outside of the digestive tract. In 95 cases the patients were congenitally handicapped or nervous and the symptoms seemed to be of functional origin.

The most puzzling group was made up of 115 cases in which the symptoms were so severe as to suggest the presence of organic disease. The syndrome often resembled that of cholecystitis, but frequently suggested the presence of ulcer or appendicitis.

The most common single cause of severe indigestion is cholecystitis. Organic disease of the stomach is rare, it was found in only 12 cases.

Among the subjects discussed by the author are the significance of infestation with intestinal parasites, chronic enlargement of the mesenteric lymph nodes, inflammation of the anal ring, mild recurring septicæmia, spondylitis, pelvic diseases of women, migraine, mucous colitis, nervous vomiting, intestinal allergy, constipation, and diarrhoea.

It is obvious from this study that further research is needed particularly in the group of cases in which the symptoms are severe enough to suggest the presence of organic disease of the digestive tract but the nervousness of the patient, the way in which the history varies with repeated telling, the absence of certain important features, the absence of roentgenological signs of disease, and perhaps the inability of the surgeon to find anything wrong at operation make a satisfying diagnosis impossible. In some of these cases the symptoms may be due to definite disease in the brain or the cord, or the nerves or blood vessels supplying the viscera.

There is no question that disease of the brain and cord can simulate acute cholecystitis or appendicitis. Supposed pathological changes have been found in the nerves and ganglia connected with the digestive tract, but it is so difficult to stain nervous tissue and to interpret what is found that Alvarez does not know what value to put on the reports so far available.

In conclusion the author says that some of the necessary advances in knowledge will probably come from better follow-up studies of patients with strange symptoms; others will be made when physicians have

a better understanding of the physiology and bacteriology of the bowel; and others will result from more careful and minute studies of the tissues obtained at autopsy.

Elman, R., and Rowlette, A. P.: The Rôle of the Pyloric Sphincter in the Behavior of Gastric Acidity. *Arch. Surg.*, 1931, xlii, 426.

Laboratory experiments by Elman and Olch having indicated that reflux of alkaline pancreatic juice into the stomach is an important factor in the regulation of gastric acidity, the authors attempted to determine whether the pyloric sphincter governs this regurgitation in a decisive manner.

In the test animals the pyloric sphincter was completely severed by a longitudinal incision and the raw surface covered with omentum. Control animals were subjected to various operations not involving the pylorus. An acid test meal of 200 c.cm. of 0.5 per cent hydrochloric acid was then given by gavage and samples withdrawn at twenty-minute intervals were tested for free and total acid. The results yielded a neutralization curve showing the effectiveness and rapidity with which the acid in the stomach was neutralized and discharged into the duodenum. The animals were tested over a period of from four to ten months.

As the gastric acidity was found to be more rapidly neutralized and the gastric emptying time somewhat reduced after division of the pyloric sphincter, the authors suggest that gastric acidity may be regulated by the pylorus rather than the reverse.

In a few clinical cases of proved carcinoma of the stomach rapid neutralization occurred after acid test meals, suggesting that a patulous pylorus may account for the anacidity in this condition or that the growth acts as a splint to the muscle, preventing its contraction and thereby promoting duodenal regurgitation.

EARL O. LATIMER, M.D.

Chauvenet, A., and Broustet, P.: Gastropyloroduodenitis and Its Surgical Treatment (Les gastropyloroduodénites et leur traitement chirurgical). *Bordeaux chir.*, 1931, 1, 16.

Gastropyloroduodenitis or "red stomach" as seen at the time of operation may have fairly distinctive features. The serosa is red over an area of varying size. The gastric wall is thickened and congested, and hæmostasis is difficult. The mucosa is very red and boggy and at times presents areas of punctate hemorrhage and small ulcerations of variable extent, depth, and arrangement. In some areas the mucosa is raised and has the appearance of a tiny abscess. In places, this milium "abscess" seems to have emptied itself.

Microscopic examination of the serosa shows little more than vasodilatation. The involvement by small round-cell infiltration, atrophy of the glands, superficial ulceration, and hyperplasia of the connective tissue is most marked in the mucosa. The submucosa and muscularis layers may be the site of congestion or a marked inflammatory reaction.

The clinical phenomena of red stomach have a cyclic character like the phenomena of ulcer, but the regularity of the symptoms and periods of relief is much less definite than in ulcer. The pain is of a more steady character, but undergoes acute exacerbations. The exacerbations are occasionally severe enough to suggest the perforation of an ulcer. Rest in bed, restriction of the diet, the application of an ice bag to the epigastrium, and even the administration of morphine give little relief. The vomitus is acid and contains blood. The temperature is slightly elevated and undergoes small oscillations. The pain is seldom relieved by alkalies, but belladonna and inert powders are of some benefit. The vomiting and hæmorrhages are in all respects similar to those of ulcer. Roentgen examination fails to demonstrate any niche or evidence of organic stenosis. Pylorospasm and violent gastric contractions are common. The gastric contents may be churned back and forth for some time before they are emptied into the duodenum. A study of the gastric chemistry is of little aid in the diagnosis. As a rule a clinical diagnosis of red stomach is made more by elimination than from definite findings.

Medical treatment should be given a thorough trial. During the acute phases of the disease the patient should remain in bed. The diet should be liquid at first and changed to solids very gradually. The application of an ice bag to the epigastrium, the hypodermic injection of atropin, infusions of glucose, and the administration of stimulants may give relief. In the acute phase of red stomach the treatment must usually be more prolonged than that for ulcer and the response is less satisfactory.

During the period of relative quiet the treatment indicated is the same as the treatment for ulcer except that alkalies are given rarely, if at all. Belladonna, bismuth, and magnesium are given in large doses.

Gastropyloritis is often resistant to medical treatment. Under such circumstances, surgery is advisable. The operation of choice is pyloric resection. In some cases, gastropyloroduodenojunostomy is beneficial. Gastro-entrostomy is contra-indicated.

W. P. VAN WAGENEN, M.D.

O'Leary, P. A.: Gastric Syphilis—Data Accumulated from Eighty-Nine Cases. *Am. J. Surg.*, 1937, xi, 286.

Gastric syphilis may be more common than the literature indicates, but it has been found in fewer than 0.3 per cent of patients with syphilis seen at the Mayo Clinic.

Eighty-nine of a group of 151 patients with gastric lesions and syphilis were discovered to have gastric syphilis. These were selected from among approximately 25,000 patients with syphilis. The diagnosis was based on the combined results of prolonged therapeutic tests, histopathological studies, morphological changes in the roentgenological characteristics, and restoration of gastric function under treatment for syphilis. The demonstration of

other evidence of clinical syphilis is not pertinent to the diagnosis of gastric syphilis. Of the 89 patients with gastric syphilis, 73 per cent had positive Wassermann reactions of the blood as the only other evidence of syphilis, and 6 per cent had negative serological reactions. The incidence of clinical signs of syphilis was almost as high in cases with gastric carcinoma (16 per cent) as in those with syphilis of the stomach (27 per cent). As conclusive evidence of gastric syphilis the scientific purist demands recognition of the treponema pallidum in excised gastric tissue. O'Leary prefers to include among the diagnostic measures a histopathological study to eliminate carcinoma. Although the treponema pallidum may be demonstrated in the gummatous type of gastric ulcer, it has not been recognized in diffuse syphilitic fibrosis. Numerous instances of gastric syphilis with bizarre clinical and microscopic features show that syphilis is a protean disease.

The incidence of cure in gastric syphilis is lower than is suggested by the occasional cases with dramatic improvement. Of the patients whose cases are reviewed by the author, 37 per cent were "cured" and 27 per cent were benefited. In cases of fibrosed syphilitic stomach the result of treatment is unsatisfactory and a plastic gastric operation offers little help. The term "linitis plastica" should be reserved for small-cell carcinoma of the stomach. Spontaneous involution or anti-syphilis treatment may account for the fibrotic leather-bottle stomach. For this condition the name "gastric syphilitic fibrosis" is suggested. When the gastric lesion is reported as operable but of indeterminate type and the response to the therapeutic test is exceptionally slow, the test should be limited and an exploratory laparotomy should be done.

As in all other forms of syphilis, early diagnosis and early treatment are rewarded by an increase in the incidence of cure.

Ameline, A., and Jonckheere, F.: Simple Gastro-duodenal/jejunal Ulcers Produced by Exclusion of the Pancreaticoduodenal Secretions (Les ulcères simples gastro-duodéno-jéjunaux expérimentaux par dérivation des sécrétions duodéno-pancréatiques). *J. de chir.*, 1930, xxxvi, 857.

The authors review the various methods which have been used to change the relations of the biliary, pancreatic, and duodenal secretions to the stomach. They emphasize the frequency with which peptic ulcer follows these changes and review the hydrochloric acid values found in normal dogs and dogs subjected to the procedures cited.

The discussion is limited to simple ulcers conforming to the histological conception of peptic ulcer. Superficial erosions are not considered.

The experiments reviewed were of the following seven types:

1. *Exclusion of the duodenum.* In experiments on ten dogs, Mann and Kawamura resected the duodenum, made a pyloroduodenostomy, and introduced the pancreatic and common bile ducts into the jeju-

num near the pylorus. At necropsy performed from one to one and a half years later, they found ulcers of the proximal jejunal loop in two of the dogs.

2. *Exclusion of the pancreas.* After ligating the pancreatic duct in twenty-four dogs, Ivy found a duodenal ulcer in one of the animals five months later.

3. *Exclusion of the biliary secretions.* Kapsinow anastomosed the gall bladder to the pelvis of the right kidney and then sectioned the common duct and closed both of its ends. Later he found ulcers about the ampulla of Vater. Other procedures reducing liver function which were followed by ulcer were partial hepatectomy (Bollmann), the formation of an Eck fistula (Mathews), and ligation of one of the two main branches of the portal vein to the liver (Gundermann).

4. *Exclusion of both the biliary and pancreatic secretions.* Mann and Williamson transplanted the common bile duct and the pancreatic duct into the ileum in thirty-five dogs. Ulcers were subsequently found in ten of the dogs.

5. *Exclusion of the duodenal, pancreatic, and biliary secretions.* This was done in three ways: (1) by isolating stomach pouches from the duodenal reflux, (2) by performing a gastro-enterostomy combined with duodenojejunosomy to cause the duodenal contents to enter the jejunum a considerable distance below the opening of the stomach into the duodenum, and (3) by forming a closed loop of the duodenum and anastomosing it to the terminal ileum. The first method produced no ulcers. Its failure to do so is explained by the fact that the pouches were made from the fundus of the stomach, a portion which is not prone to ulcer formation. The second and third methods resulted in ulcers.

6. *Exclusion of the antrum and of the duodenal, pancreatic, and biliary secretions.* In experiments on ten dogs, Winckelbauer and Starlinger sectioned the stomach at the cephalic part of the antrum and, after a complicated jejunostomy, obtained a closed circuit formed by the antrum, the duodenum, and a segment of the proximal jejunum, which they anastomosed side-to-side to the open or fundal end of the antrum. The circuit had one outlet, an artificial opening into a distal loop of the jejunum. Jejunal ulcers occurred in all of the dogs.

7. *Interruption of the duodenal, pancreatic, and biliary secretions.* Keppich fixed the proximal jejunum to the gastric fundus so that all of the secretions entered the stomach, not through the pylorus by reflux and in dilution, but isoperistaltically and undiluted. Ulcers developed in 86 per cent of the dogs.

The authors believe we are justified in drawing conclusions as to the cause of peptic ulcer in man from the findings in dogs as the lesions in man and the dog are alike grossly and microscopically and resemble each other in the occurrence of hemorrhage and perforation, the roentgen findings with regard to the emptying time of the stomach and the formation of a filling defect, and the healing which follows gastro-enterostomy.

In investigations to determine whether the experiments cited cause a chemical change in the stomach contents, MacCann found that in dogs in which the duodenum drained into the terminal ileum the hydrochloric acid values were the same as in control dogs. Weiss and Gurriaran titrated the stomach contents from dogs before sidetracking all three of the duodenal secretions past the stomach and found that the hydrochloric acid values remained unchanged after the operation. The inversion experiment had no more effect in reducing the hydrochloric acid than the sidetracking experiments had in increasing it. In dogs in which the duodenal contents emptied into the fundus, MacCann found the hydrochloric acid values normal.

The findings of the experiments with regard to the importance of hyperacidity in the causation of peptic ulcer are inconclusive since, in addition to the changes in the relation of the stomach to the duodenal secretions, other factors, such as various degrees of trauma to the blood and lymph vessels and nerves, resulted from the manipulations. CURTIS NELSON, M.D.

Ivy, A. C., and Fauley, G. B.: The Chronicity of Ulcers in the Stomach and Upper Intestine. *Am. J. Surg.*, 1932, xi, 531.

The authors report experiments which were carried out to determine the importance of mechanical, nutritional, and chemical factors and mucosal susceptibility in the development of intestinal ulcers following gastro-enterostomy. The evidence shows that all of these factors are operative, and that the mechanical and chemical factors and mucosal susceptibility are the most important. When the mechanical factor was kept constant and the chemical factor was varied, it was found that the chemical factor is the more important. When the nutritional factor was kept constant and the chemical and mechanical factors and mucosal susceptibility were studied, it became apparent that the jejunal mucosa is more sensitive to the irritating action of the gastric contents than the duodenal mucosa.

In the dog, the incidence of ulcer following various types of gastro-enterostomy showed that the size of the orifice is important; that the jejunal mucosa is much more likely to develop ulcers than the duodenal mucosa; and that pyloroplasty or gastroduodenostomy is preferable to gastrojejunostomy.

In man, the most common factor concerned in the genesis of gastric and duodenal ulcer is pylorospasm. This operates by exaggerating the mechanical and chemical factors normally present during gastric digestion. By mechanically rupturing a blood vessel, pylorospasm causes a hemorrhage into the mucosa which, on digestion of the cells in the surrounding region, develops into an erosion or an acute ulcer. The acute lesion fails to heal readily because the pylorospasm causes gastric retention. Gastric retention augments and prolongs gastric motility, and the latter, with insufficiently masticated or large pieces of indigestible residue, acts as a mechanical irritant. The motor drive of the stomach or the force of ejec-

tion of chyme is increased. Gastric retention causes also hypernormal gastric acidity and prolongs the time of contact of the gastric contents with the acute lesion, thereby increasing the irritating action of the gastric contents on the acute lesion.

It is believed that the same factors operate with mucosal susceptibility in the formation of duodenal and jejunal ulcers. Lack of a sufficient amount of alkaline digestive juices to neutralize the hypernormal acid gastric contents and failure of regurgitation of these juices into the upper duodenum and stomach toward the end of the digestive period may be contributory factors. In the dog, and possibly also in man, a third factor is also necessary for while pyloric stenosis *per se* definitely delays the healing of acute lesions, it does not result in a chronic ulcer persisting longer than about two months. According to this view, ulcer of the stomach and duodenum in man is due primarily to a disturbance of gastric physiology.

MANUEL E. LICHTENSTEIN, M.D.

Hinton, J. W.: Bleeding Gastric and Duodenal Ulcers. *Ann. Surg.*, 1931, xciii, 844.

The author reviews fifty-two cases of bleeding gastric and duodenal ulcer which have been seen in the last twenty years. Over 50 per cent were seen in the last three years and one-fifth of the total number were seen during the month of February. In all, the gross hemorrhage was sufficient to confine the patient to the hospital.

There were six deaths in the cases not operated upon and four in the cases treated surgically. In the cases not operated upon the general condition was so poor that operative intervention was contraindicated in spite of repeated transfusions. Many of the patients had no previous ulcer history. Four had been operated upon previously for chronic ulcer. Five were under medical management at the time the bleeding occurred. Two patients who were operated upon for hemorrhage have continued to bleed. The total mortality was 19 per cent.

It is of interest to note that the deaths occurred in cases without a previous gastric history. Chronic recurring hemorrhages can usually be controlled by conservative measures, but the author believes that operation is indicated in chronic cases in which the patient is incapacitated at intervals. In the latter the best procedure seems to be cauterization of the ulcer with gastro-enterostomy. Hinton regards it as questionable if partial gastrectomy is indicated for bleeding ulcer.

WILLIAM J. PICKETT, M.D.

Short, A. R.: The Treatment of Gastric and Duodenal Ulcer. *Brit. M. J.*, 1931, i, 435.

The author has analyzed statistical data regarding the treatment of gastric and duodenal ulcer which have been collected from various British, American, and Continental sources.

Until about ten years ago the diagnosis of gastric and duodenal ulcer, unless verified by perforation, operation, or autopsy, was so uncertain that the older statistics of medical treatment are untrustworthy.

Spontaneous healing is not infrequent. Perforation and hemorrhage are characteristic of chronic rather than acute ulcer. Bleeding occurs in about 25 per cent of cases of peptic ulcer. Perforation is common in ulcers of the anterior wall of the stomach and usually occurs within a year or two of the formation of the lesion. In cases of long-standing ulcers of the posterior wall the incidence of perforation is under 3 per cent.

In the best clinics, the medical treatment of gastroduodenal ulcer gives good immediate results. At least 75 per cent of the patients become symptom-free. However, only 40 per cent remain free from symptoms, and from 15 to 20 per cent die within ten years. When the duration of symptoms is less than a year, more than half of the patients remain well.

Efficient medical treatment should have a good trial, but a considerable number of the patients should be operated upon eventually. Mechanical obstruction and a large, deep ulcer that may be malignant demand early operation.

The mortality and end-results of gastrojejunostomy in an adequate number of cases treated by rank-and-file surgeons and followed up for at least four years are reported in the Collective Report of the British Medical Association. The operative mortality in duodenal, pyloric, and gastric ulcer was 5, 2.6, and 9 per cent respectively. The follow-up of patients treated for gastric or duodenal ulcer showed that the operation gave a good result in 90 per cent (a perfect result in 75 per cent) and failed in about 4 per cent. Secondary gastrojejunal ulcers occurred in 2.8 per cent of the cases of duodenal ulcer and 0.8 per cent of the cases of gastric ulcer. Subsequent cancer was rarely, if ever, reported.

Individual English surgeons report a mortality of from only 1 to 2 per cent in cases of duodenal ulcer and of from 3 to 4 per cent in cases of gastric ulcer. Their end-results are about the same as those reported in the Collective Report except that when a gastric ulcer is not removed the incidence of cure is at least 10 per cent lower.

In Continental countries and America the results of gastrojejunostomy are far less satisfactory. The mortality is about the same as that given in the Collective Report, but only from 50 to 70 per cent of the patients are cured and the condition of from 20 to 30 per cent remains poor.

Pyloroplasty gives results very similar to those of gastro-enterostomy.

Partial gastrectomy is advocated to prevent gastrojejunal ulcer and cancer and to obtain a larger percentage of cures. In England, the incidence of gastrojejunal ulcer after gastrojejunostomy is from 0.4 to 3.4 per cent and the incidence of cancer is about 2 per cent. After partial gastrectomy, the incidence of gastrojejunal ulcer is about 0.6 per cent. Anæmia may result from extensive gastrectomy. In about half of the cases it is mild; in about 10 per cent, serious; and in a few cases, quite severe.

The operative mortality of partial gastrectomy for gastric ulcer is from 4 to 10 per cent. Excellent

results are obtained in about 80 per cent of the cases and poor results in 5 per cent.

Except in cases of large, deep, adherent gastric ulcers, which call for resection, partial gastrectomy for gastric ulcer gives no better results than simple gastroenterostomy and has a mortality twice as high. Moreover, its results are not so good as those of gastroenterostomy with wedge excision of the ulcer. On the Continent and in America, where the results of gastrojejunostomy are poor, these statements do not hold good.

In cases of duodenal ulcer, partial gastrectomy and duodenostomy give results no better than those of gastrojejunostomy reported by the British Medical Association and its mortality is higher. Local excision of the ulcer, by itself, gives poor results (a cure in only 57 per cent of the cases, and no improvement in 57 per cent). Local excision with partial resection of the pyloric sphincter is better, but not so good as gastrojejunostomy.

The following conclusions are drawn:

1. If mechanical obstruction is not present and cancer can be excluded with certainty, efficient medical treatment ought to be given a fair trial.

2. If medical treatment fails or a recurrence develops, operation is indicated. For gastric ulcer, the best operation is usually gastroenterostomy with local removal of the ulcer. If the ulcer is large, deep, and adherent, partial gastrectomy is often better.

3. For simple pyloric stenosis, gastrojejunostomy is best. It is safe and satisfactory.

4. In cases of duodenal ulcer, gastrojejunostomy is the best treatment. If the ulcer is readily accessible it should be excised.

JACOB M. MORA, M.D.

Fogelson, S. J.: The Treatment of Peptic Ulcer with Gastric Mucin: Preliminary Report. *J. Am. M. Ass.*, 1931, xcvi, 673.

The ideal therapeutic agent for use in combating the irritative action of gastric juice in peptic ulcer is one that will neutralize or combine with the acid without materially stimulating or depressing gastric secretion, without materially affecting gastro-intestinal activity, and without having a general systemic action. Repeated physiological observations suggest gastric mucin as an ideal antacid. This combines readily with the free acid, it is a natural substance which plays normally a protective, soothing, and lubricating rôle in the functioning of mucous membranes, and its secretion or ingestion causes no chemical disturbances in the body and no unfavorable effect on the gastro-intestinal secretory or motor activity.

The ideal preparation of mucus would have the characteristics of the mucus which Ivy isolated in his experiments on pyloric pouch dogs. In experiments which the author carried out on dogs, mucin prepared from the gastric mucosa of hogs by the iso-electrical method was found to have a high combining power with free acid but a very low stimulating effect on the stomach. When $\frac{1}{4}$ oz mixed with 1 lb. of meat was fed, it prevented the appearance of free

acid for observation periods ranging from five to seven hours although the Pawlow pouches of the dogs showed the high free acid values which usually follow meat feeding.

The effect of feeding mucin was studied next in twelve clinical cases of ulcer in which there was a typical ulcer history, the clinical diagnosis was confirmed by X-ray examination, and the symptoms had been present from two to seven years. The patients had all been on the usual alkalinizing regimen and non-irritating diet, but had obtained only temporary relief. About 100 gm. of the mucin were given daily. In all of the cases the subjective symptoms ceased in three days. The most gratifying feature was persistent absence of pain for intervals varying from two to five months.

Lladó, M. C., Carulla, V., and Durán, F.: Roentgen Treatment of Gastric Ulcer (La radioterapia en el tratamiento del úlcus gástrico). *Rev. méd. de Barcelona*, 1930, vii, 479.

The authors report thirty cases of gastric ulcer treated by roentgen irradiation. They divide them into five groups according to the technique employed. In Group A, weak irradiation was given over a long period; in Group B, intense irradiation over a long period; in Group C, intense irradiation for a short period; in Group D, superficial irradiation; and in Group E, extra-abdominal irradiation. In spite of the differences in technique the results were very much the same in all of the cases. It seems probable, therefore, that they were due to a general effect rather than to a focal effect of the irradiation.

Roentgen irradiation often has a good effect in gastric ulcer, but it is very inconstant and so far no cause has been found for the inconstancy. The effect is noted chiefly in the clinical symptoms and the acidity of the gastric contents. Pain was relieved in 53 per cent of the cases reviewed and became worse in 30 per cent. It was relieved in 42 per cent of the cases of Group A, 20 per cent of those of Group B, 33 per cent of those of Group C, 60 per cent of those of Group D, and 50 per cent of those of Group E. Acidity was decreased in 63 per cent of the cases and increased in 17 per cent. It was decreased in 57 per cent of the cases of Group A, 67 per cent of those of Group B, 50 per cent of those of Group C, 40 per cent of those of Group D, and 100 per cent of those of Group E. However, the immediate decrease in the acidity was temporary and seemed to be due to an action on the motility of the pylorus rather than to true inhibition of secretion. The roentgen pictures were not changed particularly. The treatment seemed to have a favorable effect on hæmorrhage.

The mechanism by which irradiation acts on ulcer is not known. As experiments have shown that therapeutic doses do not cause histological changes, the results may be due to a direct action on the sympathetic nerve fibers of the stomach, an indirect action such as a change in the calcium content or the hydrogen-ion concentration of the blood or

protein shock, or an effect on the corresponding skin segment. There is no proof of any of these hypotheses. The results are so inconstant that roentgen treatment is inferior to certain dietetic treatments, alkaline therapy, and protein therapy, and probably also to treatment with parathyroid extract. However, it may be of value when employed in association with these various treatments.

AUDREY GOSS MORGAN, M.D.

Rossi, F.: **An Anatomicopathological, Clinical, and Therapeutic Study of Cases of Malignant Tumor of the Stomach Operated on Radically at the Surgical Clinic of Milan in the Period from 1919 to 1927** (Considerazioni anatomicopatologiche, cliniche e terapeutiche sui casi di tumori maligni dello stomaco, radicalmente operati nella Clinica Chirurgica di Milano dal 1919 al 1927). *Clin. chir.*, 1930, vi, 1207.

In the period from 1919 to 1927, 228 cases of malignant tumor of the stomach were admitted to the Surgical Clinic of Milan. Twenty-eight (12.3 per cent) were not operated on. In 30 (13 per cent) a simple exploratory laparotomy was done; in 87 (38 per cent), gastro-enterostomy; and in 83 (36.4 per cent), resection. The author gives the histories of the 83 cases treated by resection. In 3, the tumor was a sarcoma, and in 80, a carcinoma. The postoperative mortality was 33 per cent. Of the patients who survived the operation, 12 were lost sight of, but 2 of the latter were known to be in good health for two and a half years. Two of the patients are living nine years after the operation; 2, after seven years, and 2 after five years.

The histological findings are described in detail, and the article is profusely illustrated with photographs of the operative specimens and colored plates showing the microscopic findings.

AUDREY GOSS MORGAN, M.D.

Sanguinetti, L., and Votta, E. A.: **Ulcero-cancer (Ulcero-cancer).** *Arch. argent. de enferm. d. apar. digest.*, 1931, vi, 305.

Ulcero-cancer is cancer developing from ulcer and should be distinctly differentiated from cancer ulcerating secondarily. The development of cancer in ulcer is rare. To prove that a cancer has developed from an ulcer it is necessary to find an excavated ulcer in a sclerotic zone with the muscle layer entirely destroyed. The cancer begins in the mucous glands at the edge of the ulcer and extends toward the center. If the muscle layer is intact or more or less dissociated by the tumor, the tumor did not develop in a simple ulcer. The similarity of the two processes probably accounts for the variations in the statistics regarding the frequency of ulcero-cancer. Ulcero-cancer generally develops on the lesser curvature or near the pylorus.

The author reports a case of cancerous degeneration of an ulcer of the lesser curvature in a man of fifty-seven years. The histological findings are described in detail and shown by photomicrographs.

Gastrectomy was done and followed by gastro-enterostomy of the Billroth II type. The patient is now receiving roentgen treatment.

AUDREY GOSS MORGAN, M.D.

Luquet, G.: **The Technique of Gastrojejunal Anastomosis by Polya's Method** (Technique de l'anastomose gastro-jejunaire par le procédé de Polya). *Paris chir.*, 1930, xlii, 193.

Polya's gastrojejunal anastomosis after resection of the stomach consists of terminolateral implantation of the stump of the stomach into the jejunum. The steps of the operation in a typical case of resection for ulcer of the middle of the lesser curvature are as follows:

The duodenum is sectioned just below the pylorus and its end is closed. The closure may be done by the method of Martel, in which a suture is run around the duodenum $\frac{1}{2}$ cm. below the end, the end is invaginated into the lumen, and the suture is tied, or by the method of Mayo, in which the suturing is done over the clamp, the clamp is withdrawn, and the sutures are then tightened. In the next step of the operation, the mesocolon is lifted up and spread out and a vertical incision is made in a non-vascular area. The left half of the opening is fixed to the posterior surface of the stomach with a number of sutures running down from just below the lesser curvature toward the greater curvature. The posterior surface of the stomach is then sectioned $\frac{1}{4}$ cm. in front of the line of sutures. The serous and muscle layers are sectioned first and then the vessels are caught and ligated before the muscle is incised.

The jejunum is then opened for a distance equal to the breadth of the stomach. An assistant catches and holds the edges of the intestinal and stomach wounds so that the surgeon can suture them. When the posterior suture is finished the resection of the stomach is completed first and the anterior anastomosis is completed next. The jejunum is then pushed back through the opening in the mesocolon and the right border of the wound in the mesocolon is fixed to the anterior surface of the stomach.

In some cases the stomach must be sectioned before the anastomosis is done, and sometimes a long-loop anastomosis must be made. Under such circumstances the anastomosis is made from 20 to 25 cm. beyond the duodenojejunal angle.

The different steps of the operation and the variations in the technique are shown in illustrations.

AUDREY GOSS MORGAN, M.D.

Webb, C. H., and Wangenstein, O. H.: **Congenital Intestinal Atresia.** *Am. J. Dis. Child.*, 1931, xli, 262.

Congenital atresia and stenosis of the intestine, exclusive of the pylorus, rectum, and anal canal, is a relatively rare condition, occurring in about 1 of 20,000 infants. Webb and Wangenstein report 2 cases which came under their observation and review 15 others. Complete atresia was present in 13 cases and stenosis in 4.

The condition was first reported by Calder in 1733 and first discussed in detail by Thoremin in 1877. The obstruction is found most frequently in the lower ileum and jejunum, but may occur at any point in the intestinal tract. Of the cases reviewed by the authors, it occurred in the duodenum in 7 (above the papilla of Vater in 2 and below it in 5), in the jejunum in 2, in the ileum and cæcum in 6, in the colon in 1, and in multiple areas in 1.

The obstruction is usually single, but in about 15 per cent of the cases there are multiple areas of atresia and under such circumstances stenosis and atresia may coexist. The degree of constriction varies from stenosis to complete obstruction.

Numerous theories have been advanced to explain the occurrence of intestinal atresia. According to the theory most generally accepted, the areas of occlusion are due to persistence of epithelial buds in the intestine. According to another theory, the chief factor is an inflammatory reaction. In 2 cases the authors found several congenital anomalies. By some, the condition is believed to be the result of vascular factors such as lack of anastomosis of the mesenteric arteries and obliterative lesions and sclerosis of the mesenteric vessels. Other causes suggested are kinking of the bowel, fetal intussusception, strangulation through a mesenteric orifice, volvulus, hypertrophy of the valvula conniventes, pressure at the head of the pancreas, developmental anomalies in the intestinal mucosa, and syphilis. None of these factors will adequately account for all cases of intestinal atresia. In the authors' opinion, the most plausible theory is that ascribing the condition to failure of a portion of the intestine to acquire a normal lumen during its development.

The most frequent and prominent symptoms of congenital intestinal obstruction are vomiting, abdominal distention, absence of stools or diminution in the number of stools, and absence of bile in the stools. The infant usually seems normal and takes its feedings well for a few hours or the first day. In nearly all cases regurgitation or vomiting begins within twenty-four hours. It occurs earliest in obstruction of the upper part of the small intestine. Distention is more marked in low obstruction. Visible peristalsis is a pathognomonic sign of obstruction, and stethoscopic examination of the abdomen often reveals loud intestinal borborygmi. X-ray examination of the abdomen is of considerable aid in the diagnosis.

The prognosis is poor. The only operation which offers any promise of success is anastomosis.

SAMUEL KAHN, M.D.

Fischer, A.: Phlegmons of the Intestinal Wall (Ueber die Darmwand-Phlegmone) *Gyógyszer*, 1930, 11, 766

Phlegmon of the intestinal wall is a very rare condition. The author was able to collect only about sixty cases from the literature. The etiology is not entirely clear. According to the theory most generally accepted, the condition develops as a

local infection in lesions of the intestine, excoriations, and sites of ulceration, and as the result of penetration of the bacterial flora of the intestine. The most common sites of phlegmons are the upper portions of the intestinal tract which, because of their firmer fixation, are most exposed to mechanical injury. In almost all of the cases on record the excitant was found to be the streptococcus, but in three cases Kausch was able to demonstrate the colon bacillus as the cause.

The phlegmons are of two types. In most cases there is a diffuse, inflammatory infiltration of the layers of the intestinal wall originating in the submucosa. More rarely, a circumscribed abscess occurs in the layers of the intestinal wall.

Clinically, the condition appears as an acute, intra-abdominal surgical disease. The onset is always acute, with severe pain and vomiting. The localization of the pain is usually indefinite. The temperature is almost always high, and occasionally there may be chills. The pulse becomes poorer with the progress of the septic intoxication or the development of suppurative peritonitis. There is marked muscular rigidity corresponding to the localization. The diagnosis is very difficult; up to the present time it has never been made prior to operation. The establishment of the indication for laparotomy and recognition of the nature of the condition at the time of operation are important. The treatment consists in resection of the affected portion of the gut far into healthy tissue.

The author reports a case in which he operated for supposed acute appendicitis and resection of the intestine was followed by cure. FISCHMANN (Z).

Raiford, T. S.: Tumors of the Small Intestine: Their Diagnosis, with Special Reference to the X-Ray Appearance. *Radiology*, 1931, xvi, 253.

This article is based on a study of eighty-two cases of primary tumors of the small intestine located between the pylorus and the ileocecal junction. Forty per cent of the neoplasms were malignant. Thirty-seven per cent caused definite symptoms and were operated upon. Seventeen per cent causing symptoms were not operated upon, but were recognized at autopsy. Forty-six per cent were asymptomatic and were found secondarily at autopsy. Only a small percentage of the symptomatic group were diagnosed before operation, the majority being confused with some other intra-abdominal condition. Of the forty-two symptomatic cases, the mechanical condition brought about by the tumor was recognized in fourteen. In six of the fourteen the tumor was recognized as the cause of the symptoms, and in eight the roentgenogram was responsible for the diagnosis.

The most common tumors of the small intestine are carcinomata. These are followed closely, in the order given, by adenomata and sarcomata. Next most common, in order of decreasing frequency, are lipomata, tumors of the chronic inflammatory group, fibromata, myomata, and tumors of the carcinoid type. Rarer are hæmangiomas, hæmatomas, pan-

creatic rests, cysts, and endotheliomata. The tumors are either annular or asymmetrical and extend into or external to the lumen of the bowel.

The clinical symptoms are dependent largely on the mechanical condition in the bowel brought about by the tumor, which depends in turn upon the size and location of the growth. The author discusses the symptoms, physical signs, and differential diagnosis of benign and malignant lesions affecting the various parts of the duodenum and obstructive and non-obstructive tumors of the jejunum-ileum.

In lesions of the small intestine roentgen studies are usually less helpful than in lesions of other parts of the gastro-intestinal tract, but in some cases are of extreme value. A flat preliminary film is essential to reveal the presence of dense intra-abdominal masses. Examinations may be made advantageously half an hour and four, eight, and twenty-four hours after the administration of the opaque meal. An opaque enema may give additional information of aid in the differential diagnosis.

The reliability of the roentgen findings depends largely on the location and nature of the lesion. The duodenum presents the most satisfactory conditions for examination, but such findings as dilatation, filling defects, and encroachment upon the lumen of the bowel must be evaluated in conjunction with the clinical and laboratory findings. In the jejunum and proximal ileum it is extremely difficult to locate a lesion by roentgen examination. The most common finding is obstruction with dilatation proximal to it. In the terminal ileum the relative fixation of the bowel offers more favorable conditions for roentgen studies. Here also, dilatation, filling defects, and dense shadows suggest the nature of a lesion.

In his summary the author says that roentgen examination constitutes the best positive means of diagnosis, but is not infallible. Negative findings do not rule out a lesion and positive findings do not necessarily indicate a tumor. Doubtful findings should be checked by repeating the examination, and all roentgen findings should be interpreted in conjunction with the clinical data. ADOLPH HARTUNG, M.D.

Akerlund, Å.: Present-Day Criteria of the X-Ray Diagnosis of Duodenal Ulcer. *Am. J. Surg.*, 1931, xi, 233, 304.

Akerlund emphasizes the importance of technique in the demonstration of the various types of deformities of duodenal ulcers. Although he advocates fluoroscopy, he believes that fluoroscopic examination is of advantage chiefly to determine the best possible angle of projection for roentgenography. In roentgenography, compression is of value. To obtain compression, Akerlund employs a special diaphragm. If no special device is available, rubber balloons, cushions of cotton wool, slices of cork, or hemispheres of aluminum may be used.

The author classifies the various components which, either singly or in different combinations, make up the roentgenological deformities of duodenal ulcers, as follows:

1. Niche formation.
2. Narrowing, indrawing, pursing-up, sulcus or incisura formation, and defects in the bulbar shadows, all of which produce transverse encroachment upon the lumen of the bulb.
3. Loss of convexity, flattening, shortening, and retraction, all of which produce longitudinal restriction of the bulb.
4. Pouch formation, saccular dilatation, and diverticula formation.
5. Annular, ridge and star formations (relief deformities).

The ulcer niche is produced by entrance of the barium into the crater in the wall of the bulb. In the profile view, these niches appear as projections from the lumen, while from a view at right angles to the first, they appear as dark, dense areas, or "en face" niches. Such "en face" niches are visualized only when compression is used.

Akerlund has been able to demonstrate niches in 75 per cent of his cases of duodenal ulcer and frequently has been able to determine whether only one ulcer was present or whether multiple ulcers existed.

In practically every case the niche is associated with one or more of the abnormalities mentioned. The deformity most frequently found is transverse encroachment on the bulbar lumen. The other defects are often more obvious than the niches themselves. Usually they occur and are deepest on the greater curvature border. They may be due to organic changes such as infiltrative processes or to spasm. Roentgenologically, it is impossible to determine whether the defect is organic or functional.

The longitudinal restrictions of the bulbar lumen are commonly referred to as retractions and concavities. The retractions develop in the longitudinal plane of the bulb which passes through the ulcer itself. Therefore the deformity is usually unilateral and is on the lesser curvature border.

The pouch formations, saccular dilatations, and diverticula are the defects caused by the action or shrinkage of cicatricial tissue and the increased pressure within the bulb itself. They must not be confused with congenital diverticula. All transitional stages are found, from shallow pouches to purse-like constricted diverticula with distinct necks.

Akerlund interprets the "annular ridge" as the crest-like swelling immediately surrounding the crater. "En face," and with compression, this change appears as a circular clear zone around the crater. In profile, it gives the appearance of a local concavity bordering the ulcer. The star formations are formed by the radiating folds of mucous membrane converging toward the crater.

Although the niche is the only direct roentgen-ray sign in duodenal ulcer, it cannot be demonstrated in 25 per cent of the cases. In the absence of the niche, the diagnosis of duodenal ulcer may be made if the other component defects are present in combination.

In the differential diagnosis, the following conditions must be kept in mind: (1) affections of the gall bladder, (2) periduodenal adhesions without ulcer,

(3) new growths of the duodenum, and (4) congenital duodenal diverticula.

In addition to diagnosis, roentgen study of the bulb is of value chiefly in revealing the indications for treatment. That fresh, simple, uncomplicated ulcers with accompanying functional and transitory deformities require medical treatment is just as certain as that cicatricial, fibrous, markedly shrunken forms of ulcers, perhaps complicated with diverticula formation and shortening of the bulb, demand surgical intervention.

The author's method of examination and the various types of duodenal deformities are shown by fifty-four carefully chosen roentgenograms and photographs.

CHARLES H. HEACOCK, M.D.

Muller, G. P., and Rademaker, L.: End-Results in Radical Operations for Carcinoma of the Periapillary Region of the Duodenum. *Ann. Surg.*, 1931, xciii, 755.

Carcinoma of the periapillary region of the duodenum is rare and usually diagnosed only at operation or autopsy. Because of the situation of the tumor, blockage of the common duct occurs early. As the tumor metastasizes late, surgery may be curative. The average operative mortality of 58 per cent is due to the jaundiced state with hæmorrhage or "liver shock."

Following a review of the literature, the authors report a case in which they performed a radical resection of the tumor five years ago with apparent cure.

M. HERBERT BARKER, M.D.

Ronzini, M.: Congenital Megacolon (Sul megacolon congenito). *Riforma med.*, 1931, xlvii, 85.

The author reports the case of a girl three years old whose mother stated that when the child was five days old she had not passed any meconium and had tonic-clonic convulsions. The convulsions stopped when an enema was given. As bowel movements never occurred spontaneously, an enema was required every two or three days. The convulsions recurred from time to time. Since the child was fifteen months old her abdomen had been increasing in size. When she was admitted to the hospital it was enormously distended. During the past year she had had no convulsions, but had suffered from attacks of vomiting, dyspnoea, and cyanosis accompanied by a small, rapid pulse.

Total colectomy was performed under ether anesthesia. Histological examination showed that the muscle, nerve, connective tissue, and gland elements were normal except for hypertrophy of the muscle such as results from overwork. The author therefore rejects all theories of the pathogenesis of congenital megacolon which are based on aplasia of the muscles or nerves.

The mechanical obstruction at the sigmoid flexure which was shown by an opaque enema before the operation was probably caused by the weight of the dilated ptotic descending colon on the sigmoid which was exceedingly long and curved. While this ar-

angement was not found at operation, the author agrees with Konjetzny that when the abdomen is opened in megacolon the intestines sometimes herniate forcibly through the wound and change their position.

In the case reported the colon showed all of the anatomical features of congenital megacolon—elongation, dilatation, and hypertrophy. The author believes that the pathogenesis was mixed; that the exaggerated angulation of the sigmoid flexure was caused by embryonic elongation and dilatation, and that the muscle hypertrophy was caused by the efforts of the intestine to overcome the mechanical obstruction.

AUDREY G. MORGAN, M.D.

Charrier, J., and Leibovici, R.: Excision of Cancers of the Colon Complicated by Large Perineoplastic Abscesses (De l'excision des cancers du colon compliqués de gros abcès péri-neoplasiques). *J. de chir.*, 1931, xxxvii, 1.

This article is based on seventeen cases of cancer of the colon complicated by abscess which were collected from the literature and two cases which were treated by the authors. Perineoplastic abscesses of the colon are not always associated with perforation of the bowel, and the pus is not always of the mixed bacillus coli and anaerobic type. Sometimes an aerobic pyogenic process changes into a typical mixed anaerobic infection. The change may be explained by perforation of the bowel by a mesenteric abscess. In any case the abscess is no indication of the extent of the neoplastic process.

The authors limit their discussion to localized abscesses, leaving generalized mesenteric and retroperitoneal infections out of consideration. The three possible methods of treatment are immediate resection, early resection, and late resection.

Immediate resection. Hochenegg excised an abscess about the splenic flexure in one block with the neoplastic segment of bowel without breaking the abscess, and brought the proximal stump of the transverse colon and the distal stump of the descending colon to the surface. The result was good. This method was used in three cases with one death.

Early resection. In the first stage the abscess is drained and the tumor-bearing loop exteriorized. Then, after from five or ten days, the loop is resected. In one of the cases in which the authors used this method the patient showed no signs of obstruction, but complained of metrorrhagia. As they suspected an adnexal infection, the authors evacuated the abscess through a midline incision. On discovering a cancer without a perforation in a loop of the sigmoid, they brought the neoplastic loop to the surface near the symphysis, and near the umbilicus performed a colostomy in a more proximal loop to sidetrack the bowel contents from the cancerous loop. They then closed the abdominal wall around drains. On the ninth day the abdominal wall about the colostomy opening broke down. On the twelfth day the authors performed a second colostomy, using the ascending colon, and at the

same time resected the neoplastic loop. On exploration of the abdomen seventy-three days later, when they took down the first colostomy, they found few adhesions and no metastases. Three months after the closure of the second colostomy, the patient was in good health.

Late resection. In treatment by late resection the first stage may consist of simple incision of the abscess, of drainage and caecostomy, or of drainage and bilateral exclusion of the cancer. A cancer which appears inoperable at the first stage may often be removed easily after subsidence of the œdema following drainage. Koerte prefers to limit the first stage of the operation to simple incision of the abscess. Of eight cases which were treated by late resection (in seven by Koerte), good results were obtained in five.

Drainage of the abscess and caecostomy were done in the first stage of the operation in the authors' second case. Caecostomy decreases the chances of the formation of a stercoral fistula. In the second stage in the authors' case the left half of the transverse colon which contained the cancer was resected. Five months after closure of the caecostomy the patient was in good health.

Drainage with bilateral exclusion of the cancer was used in three cases reported by Finsterer. The first stage is a bowel anastomosis. For example, in a case of tumor of the descending colon, an anastomosis is made between the transverse colon and the sigmoid and the neoplastic segment is resected six weeks later. Finsterer obtained good results in all of his cases. The disadvantage of his operation is a lengthy first stage in the presence of intestinal obstruction, cachexia, or infection. In general, caecostomy is simpler than bowel anastomosis.

The immediate mortality in the nineteen cases reviewed was 30 per cent. Three of the patients were free from cachexia for two and a half, nine, and twenty-one years respectively.

In conclusion the authors state that cancer of the colon complicated by a large perineoplastic abscess is not necessarily inoperable. The suppuration may lead to an early diagnosis. In the stage of suppuration it is impossible to determine the extent and operability of the cancer for when an abscess is present the cancer appears to be much more extensive than it would appear in the absence of suppuration. After the abscess has been drained and the colon placed at rest for several weeks the cancer will often be found operable.

Of the three methods of treatment reviewed, the authors reject immediate resection because it is usually too difficult to resect an abscess with the cancer in one block and the patient is usually in poor condition. Early resection after several days of exteriorization is possible on the sigmoid colon when the abscess is small and the tumor can be brought to the surface without much difficulty. The authors believe that for most cases the procedure of choice is late resection following drainage of the abscess with caecostomy. CURTIS NELSON, M.D.

Royster, H. A.: The Tragedy of Appendicitis. *Pennsylvania M. J.*, 1931, xxxiv, 376.

Royster says that the present high and increasing mortality of appendicitis indicates that we have stopped talking about this malady too soon, assuming that the subject is trite and so well understood that newer diseases more urgently demand our attention. He emphasizes that appendicitis is a surgical disease from the very beginning, and that the surgeon must not cease urging early operation.

The chief causes of the increase in the mortality are delay of operation and the administration of cathartics early in the condition. The laity must be taught their dangers. Reduction of the mortality depends upon the prevention of gangrene and perforation with consequent peritonitis. Most surgeons, given the opportunity of early operation, are able to cure their cases of appendicitis with practically no mortality. Morison says: "There should be no percentage of deaths from appendicitis if every case commencing with acute pain and developing tenderness and rigidity of the abdomen and quickening of the pulse were operated upon within twelve hours."

In support of his contention that the mortality of appendicitis is increasing, Royster cites a recent report of the Department of Public Health of Philadelphia in which it is stated that during the period from 1913 to 1923 the mortality of appendicitis in Philadelphia increased 18 per cent and that laxatives administered to the patients before they reached the hospital were directly responsible for 207 deaths. Moreover, it is estimated that in the year 1926, 17,335 persons in the United States died of appendicitis, 12,655 of these were given laxatives, and 11,680 of the latter probably died from the effects of the laxatives. JOHN W. NUTZ, M.D.

Wilkie, D. P. D.: Mortality in Acute Appendicular Disease. *Brit. M. J.*, 1931, i, 253.

In spite of the early operations performed in appendicitis the mortality is practically the same as it was twenty years ago. Wilkie explains this fact by assuming that the majority of the cases now operated upon early are not of the dangerous type and that cases of the dangerous type are operated upon no earlier now than twenty years ago.

He emphasizes the importance of differentiating between two types of appendicular disease: (1) acute inflammation of the wall of the appendix, i.e., appendicitis, and (2) acute obstruction of the lumen, i.e., acute appendicular obstruction. The former is the type usually recognized. It is seldom fatal unless complicated by obstruction. The latter type differs in no way from a closed loop obstruction and is not generally recognized clinically. Because of the obstruction, colicky pains are a prominent part of the clinical picture. The temperature and pulse are apt to be normal. Because of the early gangrene from interference with the blood supply, perforation of the obstructed appendix into a free, uninvolved peritoneal cavity is apt to occur, whereas in the inflamma-

tory type of the condition perforation occurs into a part of the peritoneal cavity which has been walled off by inflammatory adhesions. Well over 90 per cent of the deaths from acute appendicular disease occur in the cases with obstruction.

When a diagnosis of acute disease of the appendix is made within forty-eight hours, immediate operation is preferable in the inflammatory type, and imperative in the obstructive type. Operation is indicated also when the diagnosis is made between the second and fourth days after the onset and signs of spreading peritonitis are noted, but when the patient is first seen four or five days after the onset of the condition and a localized tumor is found operation does more harm than good. The author says: "Those who state that there is no stage at which one should not operate may be skillful mechanics; they are not surgical pathologists."

Adequate incision is necessary, especially in the obstructive type of case. If a well-walled-off abscess is found, the appendix should not be removed unless its removal can be done without causing gross disturbance of the adhesions. Wilkie drains the abdominal wall but not the peritoneal cavity. After the operation he introduces small quantities of hydrogen peroxide through a small Carrel tube in the wound every few hours in order to prevent the development of an anaerobic infection. Since this technique has been used the postoperative convalescence during the first few days has been much smoother and there has been less sloughing of the muscle and aponeurosis. In order to avoid leaving in the wound any dead organic material which might act as a pabulum for bacteria, Wilkie sutures with silkworm gut which he loops through the peritoneum and muscle and leads out through the wound. For the treatment of postoperative intestinal obstruction which is responsible for a number of deaths, he advocates enterostomy or ileocolostomy and the use of intravenous injections of 5 per cent sodium chloride solution.

ALTON OCHSNER, M.D.

Smith, F. M., Paul, W. D., and Fowler, W. M.: The Mechanism of the Epigastric Distress Associated with an Irritable Colon and Chronic Appendicitis. *Arch. Int. Med.*, 1937, xlvii, 316.

In order to study the tone and peristaltic action of the pyloric section of the stomach, the authors fixed a rubber condom in the pylorus and connected the balloon with a bellows recorder.

In cases of irritable colon stimulated by the injection of air into the lower bowel, epigastric distress was coincident with the changes in pyloric tone and the passage of a peristaltic wave over the pyloric section of the stomach.

Patients with proved chronic appendicitis responded with a similar change of pyloric tone coincident with epigastric distress when the ileocecal region was massaged.

In patients with peptic ulcer the epigastric distress was associated with spasm of the pylorus and frequently showed a tendency toward periodicity

corresponding to what seemed to be hunger contractions. In most of the cases of ulcer, stimulation of the colon did not produce epigastric distress. However, in some instances the typical ulcer pain could be produced in this way. Epigastric distress was always associated with increased tone in the pylorus and peristalsis.

These observations indicate that the epigastric distress of a spastic condition of the colon and chronic appendicitis is of gastric origin and induced by reflex stimulation of the stomach.

GEORGE A. COLLETT, M.D.

Miles, W. E.: The Pathology of the Spread of Cancer of the Rectum and Its Bearing upon the Surgery of the Cancerous Rectum. *Surg., Gynec. & Obst.*, 1931, lxi, 350.

It is a common experience to find widespread dissemination in the perirectal tissues and even in the abdominal cavity in clinically early cases of rectal carcinoma. It seems probable that malignant cells become detached from the primary growth almost synchronously with the inception of the tumor and form more or less distant metastases by entering the lymph channels in the surrounding tissues. Although there is only one type of carcinoma of the rectum, four clinical varieties can be recognized: The papilliferous, the adenoid, the colloid or mucoid, and the melanotic.

The papilliferous carcinoma resembles a simple papilloma, but at its base the epithelial elements proliferate irregularly and penetrate the muscularis mucosae. Such a growth extends rapidly upon the surface and soon involves the whole circumference of the bowel, therefore producing obstruction long before infiltration of the muscular coat has progressed to any marked degree. For this reason, this type is not particularly malignant and seldom gives rise to extramural metastases unless it has been in existence for a considerable time. Hence it seldom recurs after removal even by an operation of the most restricted type. Obstructive symptoms caused by blocking of the lumen of the bowel lead to its early detection before extramural dissemination has had time to take place.

The adenoid carcinoma, the most common variety, appears as a sessile tumor involving the mucosa and submucosa. The growth is flattened and increases in size in all directions. While at first it is freely movable, it soon becomes adherent to the muscular coat, which it infiltrates rather early. The infiltration occurs probably within six months. At this early stage, the retrorectal lymph glands are usually invaded, a fact proving that extramural dissemination of cancer cells takes place while the growth is still in a clinically early stage of development. Therefore the adenoid carcinoma must always be considered highly malignant. After a restricted operation it will inevitably recur.

The colloid or mucoid carcinoma is merely a degenerative stage of the preceding varieties, both the epithelial elements and the connective tissues under-

going mucinoid change. It is extremely malignant and is apt to recur even after the most radical operation.

The melanotic carcinoma, the most malignant type of all, is extremely rare. It is found either in the anal canal or at the lowermost part of the ampulla, and generally upon the posterior wall. Grossly, it differs little in general appearance from the ordinary adenoid cancer, but histologically the presence of pigmentation in the epithelial and connective tissue elements reveals its true nature. Rapid dissemination takes place, giving rise to metastases throughout the body. It invariably recurs after removal.

During the process of growth, cancer of the rectum spreads in three ways: (1) by direct extension through continuity of tissue, (2) through the venous system, and (3) by means of the lymphatic system.

In direct extension in the ampulla, the growth takes six months to travel around a quarter of the circumference of the bowel. Involvement of the entire circumference by direct extension is a comparatively slow process. By the time three-quarters of the circumference has been involved, the growth has been in existence for about eighteen months. Unfortunately, however, other and more important modes of spread take place simultaneously and with greater rapidity, leading to distant dissemination even when the primary growth is still in an early phase of development.

In spread by the venous system the cancer cells invade the venous radicles and then, becoming detached from the main body, are swept into the venous system and carried to a great distance from the primary growth. As this mode of spread is rare, it can be disregarded when operability is considered. It cannot be controlled by either surgical or other means.

Spread by way of the lymphatic system is by far the most important of the modes of dissemination of cancer cells in the perirectal tissues and to distant parts. The author emphasizes that a thorough knowledge of the lymphatic system is essential to the performance of any radical operation for cancer. He presents a very detailed description of the rectal lymphatics. The rectal lymphatics fall into three groups: namely, the intramural, the intermediary, and the extramural.

The dissemination of cancer cells by way of the extramural lymphatic system is more widespread and of much greater consequence than dissemination along the intramural lymphatics. Moreover, it appears that, of the three zones of possible extramural spread, the upper zone is the most important because secondary deposits, visible to the naked eye or with the aid of a microscope, are always found in this zone. By carefully determining the position of metastases during the performance of operations and noting the locality affected by the recurrent growth either clinically or during the performance of secondary operations, recording the extent and

position of metastases in cases in which operations were abandoned on account of the presence of metastases, studying the postmortem findings in regard to the spread of cancer in cases of death from advanced and inoperable cancer, and following the detailed macroscopic and microscopic examinations of specimens removed by operation, it has been possible to map out with considerable accuracy the tissues that are liable to metastatic deposit during the progress of the disease and to recurrence after restricted operations. The tissues chiefly involved in the spread of cancer of the rectum are the ischio-rectal fat, the levatores ani, the pelvic peritoneum, and the pelvic mesocolon. Pathology teaches that these tissues may be the site of metastatic deposits even when the growth in the rectum is in a clinically early stage, and that unless they are completely removed whenever an operation for the removal of the cancerous rectum is undertaken, postoperative recurrence will develop in practically every case.

ANTHONY F. SAVA, M.D.

Rosser, G.: The Etiology of Anal Cancer. *Am. J. Surg.*, 1931, xi, 328.

Although Ewing and others have expressed the theory that chronic irritation plays no demonstrable part in the production of malignancy of the anus, Rosser is of the opinion that fistulae, hemorrhoids, and cicatrices in the anal canal are exciting causes of anal cancer. He states that in the lower portion of the canal the excitation may act directly to produce epitheliomata, and in the upper portion may act indirectly with adenoma formation as an intervening stage.

Of thirteen cases of anal cancer seen in the author's hospital services, the cancer had been preceded by a benign anal disease in twelve. In seven of the twelve the antecedent lesion was a fistula; in four, hemorrhoids; and in one, chronic cryptitis and papillitis. Rosser reviews eighteen other cases from the literature. He suggests that a more careful investigation of the history and preceding local changes in cases of anal cancer would increase the number of similar cases recorded.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Rouillard, J., and Schwob, R. A.: Peritonitis with Extravasation of Bile in the Absence of a Visible Perforation of the Biliary Tract (Peritonite avec épanchement bilieux sans perforation visible des voies biliaires). *Bull. et mém. Soc. méd. d. hop. de Par.*, 1930, xlvii, 1891.

The authors report the case of an eighty-three-year-old woman who died of peritonitis in which the peritoneal fluid contained a considerable quantity of bile although there was no demonstrable perforation of the biliary or gastro-intestinal tract.

Only thirty cases of this type of peritonitis have been reported in the literature. The authors attribute the condition to acute distention of the gall

bladder from stone or a carcinoma of the head of the pancreas followed by transudation of the biliary fluid through the oedematous walls of the gall bladder and infection. They state that, in spite of its rarity, it must be borne in mind in the differential diagnosis of acute lesions of the upper abdomen suggesting the perforation of a viscus. If the case is seen relatively early, cholecystectomy is indicated.

W. P. VAN WAGENEN, M.D.

Kment, H.: Operative and Late Results of Operations on the Biliary Tract (Operations- und Dauererfolge nach Eingriffen an den Gallenwegen). Beitr. z. klin. Chir., 1930, cl, 534.

The author reviews the material from the Schloffer clinic from 1912 to 1924. Four hundred and twenty-seven patients (98 men and 329 women) with bile tract disease (exclusive of acute pancreatitis and carcinoma) were operated upon with 29 fatalities, a mortality of 6.79 per cent. The fatalities occurred chiefly in neglected cases in which an early operation might have saved life. The most common conditions in the latter were cholangitis and long-standing common duct obstructions. Of 245 patients operated upon in an interval between attacks, 5 (2.04 per cent) died, and of 117 operated upon during an attack, 17 (14.5 per cent) died. Of 15 patients who had come to operation in extremely poor condition and upon whom transduodenal choledochotomy was performed, 2 (13.3 per cent) died. Of 243 patients operated upon between attacks, 23 had no stones, although all but 3 showed indisputable evidence of previous inflammation.

The report of the late results is based on 293 patients (73.1 per cent of the total number) who could be traced. Of these, 18 died of intercurrent diseases which had no relation to the operation. Of the remainder, 91 per cent were fully able to work, but 8.4 per cent could do only light work or none at all. The cases of the latter are discussed in detail. It is shown that, aside from definite recurrences and gastric disturbances which might possibly have had their origin in the operation, the symptoms in a number of cases had no relationship whatever to the bile-tract disease or the operation.

The patients whose symptoms were acute and had not been present longer than one week and who had never had a previous attack were invariably cured permanently; likewise, those whose symptoms had remained entirely latent for years, and in whom the attack which led to operation was at most the second or third. Failures occurred in the cases in which the first attack had not entirely subsided and after ineffective treatment or after a period of weeks or months operation was done following the onset of a new, severe attack. Therefore operation is definitely indicated during the acute attack, as soon as the diagnosis is made unless the attack is very mild. In patients with empyema of the gall bladder the late results were especially poor. Of 29 patients, 21.7 per cent were unable to work. The author concludes from his relatively small ma-

terial that it is better to operate upon cases of empyema in 2 stages. For all other cases he is opposed to cholecystostomy if it does not constitute a preliminary operation for a subsequent cholecystectomy. Cholecystectomy is considered the operation of choice. Transduodenal choledochotomy has been particularly valuable in stones in the ampulla. Primary closure of the abdominal wall is inadvisable because of its dangers. Improvement of the late results is not to be expected from it. With positive diagnosis, careful and technically faultless operating at the proper time, and proper after-treatment it should be possible to improve the operative and late results materially. COLAERS (Z).

Serra, V.: A Clinical and Anatomopathological Contribution to the Study of Cancrocirrhosis (Contributo clinico ed anatomopatologico allo studio della cancrocirrosi). Policlin., Rome, 1931, xxviii, sez. med. 64.

This article is based on a detailed study of four cases of cancrocirrhosis and a review of the literature on the condition. In only one of the four cases, that of a luetic man with a hereditary predisposition to cancer, was an early diagnosis possible. In this case the diagnosis was based on pain, hemorrhagic ascites, and the findings of physical examination of the liver. The author emphasizes the impossibility of making an exact diagnosis of the nature of the neoplastic process. Cancrocirrhosis, as well as sarcoma, may occur in young persons and run a rapid course, and may be associated with a high temperature and unassociated with icterus. It is this difficulty of diagnosis to which surgeons attribute their almost general failure in operations on hepatic tumors.

As regards the important question of a possible connection between adenomatous and cancerous formations, the author reaches the conclusion that no pathogenetic relationship is demonstrable by our present methods of investigation. Therefore we must revert to the old theory of Corazza that the co-existence of cancer and cirrhosis is purely accidental, a theory upheld by Sabourin and Gabbi and recently by Mikula and Klein.

WILLIAM W. WHITELOCKE, Ph.D.

Gosset, A., Bertrand, I., and Gonnelli, V.: Cytological Studies of the Gall Bladder (Etudes cytologiques sur la vésicule biliaire). Ann. d'anat. path., 1931, viii, 97.

The authors made histological examinations of ten gall bladders showing the most varied lesions of cholecystitis. They describe the staining technique in detail and show the findings by means of photomicrographs. They state that the d'Achucarro-Hortega tannin-silver stain is a very good one for the study of the epithelial mitochondria. Paraffin inclusion helps the impregnation.

The mitochondria show considerable variation depending on the position of the epithelial cells in the gall bladder and the pathological condition. In

cholecystitis, they become granular. In strawberry gall bladder they are filamentous. In ordinary cholecystitis, the chorion shows no trace of mitochondria, but in strawberry gall bladder there is an intense infiltration in the connective tissue network as in the epithelium, demonstrating unusual activity of the reticulo-endothelial tissue. The bipolarity of the epithelial cells, which has been shown in the normal gall bladder, persists in the pathological processes studied by the authors.

AUDREY G. MORGAN, M.D.

Bockus, H. L.: Shay, H., Willard, J. H., and Pessel, J. F.: A Comparison of Biliary Drainage and Cholecystography in Gall-Stone Diagnosis, with Special Reference to Bile Microscopy. *J. Am. M. Ass.*, 1931, xcvi, 311.

The authors believe that non-surgical biliary drainage is a very important procedure in the diagnosis of gall stones. They had a series of 124 operative cases in which the cholesterol crystals or bilirubin calcium pigment or both were recovered from the bile by the duodenal route before operation. The evacuation of B bile from the gall bladder was usually necessary to recover these pigments. For cases in which gall stones are suspected, the authors advocate the repeated application of stimulating solutions to the duodenum until B bile is obtained. In many cases of stone the bile has a reddish or brick-brown tint which is possibly due to its increased pigment content. A careful search for typical pigment should be made whenever this type of bile is recovered. In 5 per cent of the authors' cases the pathognomonic elements were recovered only after the bile was centrifugalized.

The finding of cholesterol crystals and bilirubin calcium pigment in the same bile was pathognomonic in 72 cases. The finding of cholesterol crystals without the characteristic pigment (18 cases) led to a correct diagnosis of gall stones in 89 per cent, and the finding of bilirubin calcium pigment (34 cases) led to a correct diagnosis on 90 per cent.

The comparative value of bile drainage and cholecystography was studied in 148 proved cases of cholelithiasis. A positive diagnosis was suggested by drainage in 85.2 per cent and by cholecystography in 29.2 per cent. Evidence of a pathological condition of the gall bladder was shown by cholecystography in 88.4 per cent of the cases and in 98 per cent by drainage. The authors conclude that if only 1 study is carried out, intravenous cholecystography is superior to drainage and oral cholecystography as a gauge of gall-bladder function.

ROBERT ZOLLINGER, M.D.

Bilger, F., and Fontaine, R.: Cases of Gall Stones Associated with Kidney Disease (A propos de quelques observations de lithiase biliaire et d'affection rénale intriquées). *Rev. de chir.*, Par., 1931, 1, 34.

The authors report five cases in which gall stones and kidney disease were associated. In three, the

right kidney was affected and in two the left. In all, the presence of gall stones was verified by roentgen examination and in four by operation. In all of the cases the kidney disease was unilateral. In four, it was pyelonephritis, and in two this condition was associated with nephroposis. In one case there was a renal calculus in a hydronephrotic or polycystic left kidney. The renal suppuration was caused by the colon bacillus. The kidney disease was treated by irrigation of the renal pelvis in all of the cases, and the gall stones were removed by operation in four.

It is not known whether the two diseases were independent of each other or one produced the other. As the kidney affections were caused by the colon bacillus, it might be assumed that the disease was a hepatorenal condition originating in the gall bladder. However, it is possible for nephroposis to cause the formation of gall stones.

The abdominal symptoms in such cases are generally slighter than the kidney symptoms and may be disregarded or considered reflex disturbances associated with the kidney disease. If the diagnosis is not made before pyuria begins the patient is more apt to go to the urologist than to the surgeon. In the authors' cases the pyuria brought the patients to the urologist only after they had been treated for a long time for enteritis, constipation, or hepatic colic. The physician should bear in mind the possible co-existence of gall stones and kidney disease. The diagnosis can be made comparatively easily now by means of cholecystography and profile roentgenography.

AUDREY G. MORGAN, M.D.

Desplas, B., and Meillère, J.: Cholecystostomies of Derivation. Technique and Indications of the Conservative Cholecystostomy (Cholécytostomies de dérivation. Technique et indications de la cholécystostomie continente). *Presse méd.*, Par., 1931, xxxix, 91.

In the technique used by the authors for cholecystostomy a vertical incision is made over the gall bladder from the costal margin downward 10 cm. at the lateral border of the right rectus muscle. The gall bladder is then seized, emptied by means of a syringe, and incised. Following the removal, with a gall-bladder curette, of any stones which may be found, a No. 18 Pezzer catheter is inserted. Four sutures are then introduced in the gall-bladder wall at a distance of 1 cm. from the incision and by tying these sutures the wall of the gall bladder is invaginated tightly about the catheter. The ends of the sutures, four on each side, are then passed through the parietal peritoneum and the posterior aponeurosis and tied to bring the gall bladder into intimate contact with the anterior abdominal wall and shut off the operative field from the peritoneal cavity. The abdomen is then closed above and below without drainage. An operculum is slid over the catheter and held against the skin by adhesive.

This operation is attended by very little operative shock, it may be done under general or local anæ-

thetia, it renders peritoneal drainage unnecessary, the operculum prevents irritation and ulceration of the abdominal wall by bile, and the fistula closes rapidly when the catheter is removed.

The indications for cholecystectomy recognized by the authors are hydrops of the gall bladder, sclerosing atrophic cholecystitis, a markedly infected phlegmonous or gangrenous gall bladder, rupture or perforation of the gall bladder, and degenerative cholecystitis.

The authors regard cholecystostomy as indicated in cases of infection of the main bile ducts, cholangitis, calculus of the common duct, and black bile, and when the illness is humoral, the liver is enlarged, the pancreas is involved, or a severe subhepatic perivisceritis is present—in short, in all cases in which the general condition is precarious.

JAMES B. MASON, M.D.

MISCELLANEOUS

Giustinian, V., and Estiú, M.D.: Congenital Diaphragmatic Hernia in an Infant (*Hernia diafragmática congénita en el lactante*). *Semana med.*, 1931, xxxviii, 35

A boy three months old was admitted to the hospital for attacks of suffocation and asphyxia. Dullness and respiratory silence were found over the whole left hemithorax. Roentgenoscopy revealed

dextrocardia and, in the center of the diseased hemithorax, the image of a small, perfectly spherical cavity surrounded by incomprehensible diffuse shadows.

For about forty days the infant had had attacks of asphyxia with cyanosis which occurred after effort (crying, nursing, etc.) permanent discrete dyspnoea, a dry cough, and constipation. On account of the absolute dullness in the left half of the thorax, two pleural punctures were done. These were negative. A tentative diagnosis of tumor of the lung was made. The condition continued to get worse and death occurred twenty-five days after the infant's admission to the hospital.

Autopsy revealed a diaphragmatic hernia. The mass of the small intestine had passed under and behind the stomach into the left hemithorax, carrying with it the cæcum and the ascending and transverse colon, displacing the heart to the right, and collapsing the lung.

It is worthy of note that the child lived four months with a congenital lesion which reduced the field of aeration to a single lung functioning under difficulties. The diagnostic error did not influence the outcome. Congenital diaphragmatic hernia in its embryonal form is an anomaly of such magnitude that it is incompatible with life and impossible to remedy because of technical difficulties.

MARGUERITE P. SLOAN.

GYNECOLOGY

UTERUS

Uebel, P.: The Treatment of Myomata and Hæmorrhagic Metropathies at the Würzburg University Gynecological Clinic in the Period from 1923 to 1928 (Ueber die Therapie der Myome und hæmorrhagischen Metropathien an der Würzburger Universitäts-Frauenklinik, 1923 bis 1928). *Strahlentherapie*, 1930, xxxviii, 438.

The author reviewed 1,048 cases of myoma of the uterus and hæmorrhagic metropathies treated at the Würzburg University Gynecological Clinic to determine the value of irradiation therapy in these conditions. In the first part of this article he discusses the guiding principles of the treatment in general. Sixty-eight cases were treated by curettage alone, 891 by irradiation, and 89 by operation. Of the 451 cases of metropathy, 90.7 per cent were treated by curettage and irradiation, 2.2 per cent by irradiation alone, and 7.1 per cent by curettage alone. Curettage was done in about 90 per cent of the total number of cases, not only for therapeutic purposes, but also for diagnosis. Curettage alone is of course applicable only in cases in which the only symptom is hæmorrhage. In 68 such cases it proved sufficient to control the bleeding over an observation period of more than a year, but in 4 cases irradiation was necessary in addition. When curettage alone was not sufficient, irradiation was always applied in cases of metropathy and was applied whenever possible in cases of myoma.

The definite indications against irradiation and for operation are: (1) an uncertain diagnosis, (2) young age of the patient, (3) certain localizations, pedunculation, or incarceration of a myoma, (4) abnormal size of a myoma, and (5) degeneration in a myoma.

With the passage of time the irradiation was given with radium more and more frequently as radium irradiation has the advantage of causing rapid hæmostasis. However, this advantage is lessened by the fact that the application of radium is not entirely harmless as it may be followed by inflammatory, infectious complications. In some of the cases reviewed, a combination of roentgen and radium irradiation was employed. The roentgen irradiation was usually applied to 2 fields, but the radium was always introduced within the uterus. In recent years permanent amenorrhœa has come up for consideration as the objective because the possibility of injury to the ovum from temporary roentgen amenorrhœa cannot be excluded. In roentgen irradiation the induction of permanent amenorrhœa is assured by the application of a dosage of 34 per cent of the skin unit dose (measured in the depths) or about 275 roentgen units. In some cases a smaller dosage is sufficient. In radium irradiation, about 3,000 mgm.-hrs. are required.

In the second part of his article the author reports statistics and shows curves based on the cases reviewed.

In the third part he again subjects his material to a critical discussion. He comes to the conclusion that in cases of myomata of the uterus and hæmorrhagic metropathies irradiation has given complete satisfaction and extension of its indications is desirable.

WEINERITZ (G).

Tietze, K.: Regressive and Progressive Processes in Functionally Abnormal Proliferating Endometrium. 1. The Cause of the Hæmorrhages in Glandular Cystic Hyperplasia Due to Persisting Maturing Follicles—Hæmorrhagic Metropathy. 2. The Danger of Carcinoma in This Functionally Abnormal Endometrium (Regressive und progressive Prozesse in funktionell abnorm proliferierten Endometrien. 1. Ursache der Blutungen bei der glandulær-cystischen Hyperplasia infolge persistierende reifender Follikel—Metropathia hæmorrhagica. 2. Die Carcinomgefahr in diesen funktionell abnormen Endometrien). *Arch. f. Gynæk.*, 1930, cxlii, 680.

In the introduction to this report the author gives the reasons why he has again taken up the study of glandular hyperplasia of the endometrium from the purely anatomical standpoint. He regards this explanation as necessary because Zondek, in his work entitled "Polyhormonal Disease Pictures," expressed the opinion that, impressed by the striking results of anatomical investigations, we have already gone too far in the anatomical analysis of these disease conditions. Tietze believes that the anatomical bases of disturbances of the menstrual cycle are not yet definitely known in all of their details or generally recognized, and that there is absolutely no uniformity of opinion regarding the clinical syndrome and its application to differential diagnosis. Zondek's work mentions disease conditions associated with irregular hæmorrhages which have no relation to hæmorrhages due to abortion or neoplasm formation. These are the hæmorrhages which occur during puberty and the climacterium and occasionally also in the intervening years. Tietze calls attention to the fact that whereas Aschoff and Pankow proposed the concept of metropathia hæmorrhagica without being able to establish a definite anatomical foundation for it, Schroeder has reserved this concept for irregular atypical continued hæmorrhages occurring in the period of puberty and the climacterium and occasionally in the intervening period which have glandular hyperplasia of the endometrium as their anatomical basis. Schroeder has always considered this glandular hyperplasia a pathological hormonal effect exerted on the endometrium by the persisting follicle. The theory re-

cently advanced by Shaw, that the disease of the endometrium is primary, cannot be accepted under any conditions.

The author has again studied the source of the hemorrhages anatomically in 100 cases. In 87 he found distinct signs of circulatory disturbances in the form of stasis, thrombosis, and foci of necrotic degeneration. In a number of illustrations he shows the necrotic foci of varying size arranged in a wedge formation, larger and smaller isolated areas of oedema produced by congestion of nearby vessels, and isolated thrombi of fibrin in the vessels without necrosis of the neighboring tissues. He emphasizes that the glandular cells always show the stage of proliferation and never show secretion. The principal differences may be summarized as follows:

Menstruation

Menstruation is the end of a cyclic functional course in the endometrium

The necrosis affects the entire mucous membrane almost uniformly

The mucous membrane separates at a definite layer level and within a few hours. About 4 mm. of mucous membrane are lost by a rapidly progressing destruction within forty-eight hours. The denuded base is left behind, and bleeding occurs from the vascular stumps which are arranged in groups. The bleeding is stopped by powerful muscular contraction. The wound heals two days later

Glandular cells at the end of their secretory activity are present in the necrotic areas

Numerous leucocytes infiltrate the necrotic areas diffusely and uniformly. The bloody infarction plays only a small part

Glandular Hyperplasia

The hemorrhage is the sign of a cyclic deviation in the form of abnormally increased proliferation

The necrosis appears focally and without normal change in the secretion, and spreads gradually

The necrotization spreads gradually and the process may continue even for as long as from two to four weeks. At first the mucosa is reduced very gradually and then grows from continued proliferation in the depths so long as functioning follicles remain in the ovary. Bleeding occurs from the portions undergoing necrosis. Uterine contractions control the bleeding only poorly as they are hampered by the thick, spongy substrate of the mucosa.

Glandular cells of a proliferative character are present in the necrotic areas

Few leucocytes are found. Most prominent is the thrombotic infarcting process

In some cases the author was able to examine the curettings several times. He never found an unequivocal transition of the glandular hyperplasia into carcinoma. In only one case did he at one time see a picture suggesting malignancy, and in this instance curettage done three weeks later immediately ruled out malignancy. Moreover, in many examinations which he has made of material of the Kiel Clinic since October, 1922, he found a suggestion of carcinoma only in a case with a co-existing granulosa-cell tumor of the ovary.

Tietze concludes that glandular hyperplasia of the endometrium represents a fairly indubitable definite histological state although within its limits it may appear to vary to a considerable degree. Its

essential characteristic is the cyclic interruption. The phase of proliferation is not interrupted; instead of undergoing transformation into the secretory phase, it is maintained. Hyperplasia of the glands and of the stroma and local necroses due to circulatory disturbances are the characteristic triad. The details of the picture depend apparently upon the individual reaction to the hormone pathological stimulus. The field of the reaction here, as everywhere, plays just as important a part as the pathological stimulus itself. Therefore without preference for the one or the other field of investigation, a complex consideration of such a disease picture as metrorrhagic hemorrhagia with persistence of follicles (glandular cystic hyperplasia of the endometrium) is necessary.

HANS O. NEUMANN (G).

Werner, P.: Vaginal Extirpation of the Uterus and Adnexa on Both Sides. *Surg., Gynec. & Obst.*, 1931, lii, 333.

The author describes a method of extirpating the uterus when the organ is fixed in retroflexion and there is considerable inflammation of the adnexa. He states that this method is of value also for vaginal hysterectomy for bleeding or fibroids, especially when technical difficulties are caused by such factors as obscure anatomical relations.

The operation is a modification of his method for vaginal hysterectomy. The uterus is split *in situ* and each half is extirpated with its adnexa.

Werner loosens and removes first the tumor of the side which seems less difficult to handle. The other side is then removed more easily because of the increased amount of space.

HARRY M. NELSON, M.D.

MISCELLANEOUS

Schroeder, R., and Jacobi, H.: The Effects of Lipiodol on the Mucous Membranes of the Genital Tract and Pelvic Peritoneum. The Value of Hysterosalpingography (Ueber die Wirkung des Lipiodols auf die Genitalschleimhaut und des Beckenbauchfell. Beitrag zur Brauchbarkeit der Hysterosalpingographie). *Arch. f. Gynaek.*, 1930, cxlii, 514.

The authors report studies carried out to determine the resorption time and the effects on the internal genitalia of lipiodol injected for roentgen visualization of the uterus and tubes. They begin their article by citing cases in which injury or even death followed hysterosalpingography with lipiodol. The contrast medium employed was 40 per cent lipiodol, a vegetable oil containing 0.54 gm. of iodine per 1 c.cm. All of the tissues obtained later were subjected to a thorough histological examination. The tubal tissues examined were usually obtained at operation for chronic adnexitis and the specimens of endometrium chiefly at operation for myoma. The peritoneum was studied at laparotomy for various conditions. The residual lipiodol was studied in the histological sections by staining with Sudan-

III. It was usually found in an extremely divided state between and in the cells, particularly in those near the basal membrane, or in the lymph channels where it was undergoing resorption. In some cases the resorption had been slight, but in the majority it had been considerable. In the latter there were heavy collections of fat droplets between and in the epithelial cells.

On the basis of their studies the authors conclude that under normal conditions the injection of from 3 to 5 c.cm. of lipiodol will not harm the internal genital tract. Therefore they believe that hysterosalpingography may be used even in cases in which the genital organs must be left in a normal state, e.g., cases of sterility. They emphasize, however, that there must be no inflammatory condition of the cervical canal and no macroscopically or microscopically demonstrable intermenstrual bleeding. The leucocyte count, the sedimentation time of the blood, and the body temperature must be normal. When there are inflammatory changes in the region of the adnexa, lipiodol will be non-irritating only in the absence of fresh signs of inflammation. If too much lipiodol is injected there is danger of oil peritonitis. The manipulations must be conducted aseptically. As the best time for hysterosalpingography in cases of regular menstruation, the authors recommend the second and third weeks of the four-week cycle.

WEHEFRITZ (G).

Muenzesheimer, J.: Death Following Profuse Menorrhagia at Puberty with Absence of Corpus Luteum Formation (Toedlicher Ausgang profuser Pubertaetsblutungen bei fehlender Corpus-luteum-Bildung). *Zentralbl. f. Gynaek.*, 1930, p. 2953.

The author reports a fatal case of uterine hæmorrhage occurring in a girl seventeen years of age. Since their onset at the age of fourteen, the menses had always been irregular and profuse. The patient was brought to the clinic with severe uterine hæmorrhage which endangered her life. She was treated by injections of insulin, and because of the extreme urgency of the case curettage was done. This controlled the hæmorrhage. The patient was discharged shortly in an improved condition, and for four months there was no further bleeding.

Following this interval the bleeding recurred with even greater intensity and persisted so long that the patient was again brought to the clinic in a critical condition. Death followed shortly after her admission as the result of extreme secondary anæmia.

At autopsy the almost complete absence of follicles and corpora caudicantia in both ovaries was the most striking finding. This was a case of abnormal ovarian function, the absence of corpora lutea (the function of which, according to Adler, is to terminate menstrual bleeding) resulting in persistent recurrence of menorrhagia. H. LEWIN (G).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Quigley, J. K.: *Pregnancy and Labor in the Elderly Primipara*. *Am J Obst & Gynec*, 1931, xxi, 234.

It is still more or less generally believed that in the cases of elderly primipara pregnancy is apt to be complicated and labor difficult and the risk to the child during labor is higher than in the cases of young primipara.

In 304 cases of pregnancy and labor in elderly primipara which are reviewed by the author the incidence of nausea and vomiting, twin pregnancy, babies larger than the general normal ($7\frac{1}{2}$ lb.), abortion, premature labor, and fibromyomata was no higher than in the cases of multipara of the same age and the fetal mortality was no higher than the general average. Dry labors, if frequent, were shorter than labors in which the membranes ruptured later. The findings did not show an increase in the length of labor; in fact, the labors were shorter than in all primipara by an appreciable length of time.

On the other hand the incidence of toxæmia of pregnancy, funnel pelvis, unfavorable presentations and positions, and the indications for cesarean section were slightly increased. However, only a few abdominal deliveries were done solely on account of the patient's age. The cases of contracted pelvis would have demanded cesarean section if the woman had been a young primipara.

In a small group of cases there is first-stage dystocia in which long labor will not dilate the cervix. In many of these the dystocia is due to primary inertia and in only a few to rigidity of the cervix. In some, cesarean section should be done.

In most of the cases of dystocia in the series reviewed the delay occurred in the second stage. As a rule it was due to inertia, but sometimes was caused by rigidity of the pelvic floor. This explains the frequent resort to low or medium low forceps extraction. The results so far as the fetal mortality or the condition of the pelvic floor was concerned were good. Elderly primipara seldom have satisfactory lactation.

E. L. CORNELL, M.D.

Vermelin, H., and Vaisbuch, A.: *Pregnancy After the Fiftieth Year of Age* (La grossesse après cinquante ans). *Rev franc de gynéc. et d'obst.*, 1931, xvi, 12.

Vermelin and Vaisbuch have observed a case of pregnancy in a woman over fifty years old. The extreme rarity of this occurrence is evident from the paucity of well-authenticated cases reported in the literature. The records of 28,277 women admitted to the Obstetrical Hospital at Nancy in a period of thirty years show only 1 case of pregnancy after the

fiftieth year of age—that of a woman who was fifty-one years old.

The age at which the child-bearing capacity is lost is difficult to determine. The relationship between ovulation and menstruation suggests that the period of fecundity ends at the time of the menopause, but there are authentic cases of gestation occurring after the menopause. Although menstruation always signifies a preceding ovulation, the reverse does not hold true, as is evident from pregnancies occurring before puberty and after the menopause.

Ovarian activity does not stop with the cessation of the menstrual cycle. A mature ovum capable of being fertilized may be produced long after the endometrium has ceased to function. Pregnancy occurring at an advanced age would appear to indicate ovarian activity of great intensity. The onset of the menopause appears to be accelerated by chastity and retarded by multiparity. This accounts for the fact that the pregnancies occurring after the fiftieth year were in multipara. As a rule, pregnancy at this age is undesired by the woman and gives rise to psychic disturbances. While in some instances great happiness is caused by the supposed return of lost youth, in most cases there is a feeling of shame and fear leading to psychoses and attempts at suicide. Physically, the elderly gravida tolerates pregnancy exceptionally well. Of the 20 cases of pregnancy in elderly women which the authors were able to collect, albuminuria occurred in only 3, and in each of these it was due to a pre-existing nephritis. Endocrine disturbances and toxæmia manifested by hyperemesis and eclampsia did not occur. Uterine complications such as abortion and placental hemorrhage were rare. Hydatidiform mole was found in 5 (20 per cent). Although this may have been entirely a coincidence, the authors suggest that cystic degeneration of the villi may have been caused by senile degeneration of the ovum. Ventral hernia, acute anteversion of the gravid uterus, and malpositions of the fetus resulted from the lack of support due to weakness and atonicity of the abdominal musculature. While in some cases labor appeared to be unduly prolonged, in others delivery was rapid because of the lack of resistance of the atrophic perineal musculature. The uterine contractions were often ineffectual. Anteversion of the uterus interfered with cervical dilatation, necessitating frequent interference and delivery by forceps or version and extraction.

The puerperium was in no way unusual. Lactation was quite normal. The authors disagree with Halban who is of the opinion that the infants born to elderly gravida are exceptionally large because of changes in metabolism. In the cases reviewed by them the infants weighed somewhat less than the

average, but were apparently healthy and developed normally.

HAROLD C. MACK, M.D.

Aburel, E., and Ornstein, I.: Studies of the Blood Calcium in Obstetrics (Considerations sur la calcémie en obstétrique). *Gynéc. et obst.*, 1931, xxiii, 30.

The authors state that the majority of studies of the blood calcium which have been made in the past must be discarded because the methods employed were inaccurate. The micro-method which they use eliminates the organic substances in the blood and permits easy calculation of the calcium content of the mineral residue with an error not exceeding 4 mgm. per liter. Determinations of the total blood calcium are of no value; only those of the calcium content of the serum and blood plasma are of importance. Moreover, recent researches have demonstrated that only the ionized fraction of the serum and plasma calcium is physiologically active. The authors have therefore limited their investigations to the blood serum.

In non-pregnant women the blood-calcium values do not differ greatly from those of men, but show slight variations during the menstrual cycle. After castration and the menopause there is usually a definite hypocalcemia. Pregnancy also produces a hypocalcemia, the result of modifications brought about by hormone activity (hypophysis, placenta, etc.).

Blood calcium determinations during pregnancy disclose merely the existence of alterations in the calcium metabolism and plasma tolerance, giving no information as to the degree of decalcification of the maternal organism nor of the amount of calcium taken up by the fetus. Lowering of the blood calcium may result in increased neuromuscular excitability to the point of spasmophilia and tetany and, by decreasing renal function, cause chloride retention. It plays a part in the symptoms of women suffering from hyperemesis, eclampsia, and hypertension, but cannot be considered the prime cause of these conditions.

The blood calcium is an important factor in the regulation of fetal development as it undoubtedly influences the fetal body weight and the bony structures and determines the compressibility of the skull. However, the authors were unable to demonstrate any difference in the blood-calcium values of mothers giving birth to large infants and those giving birth to small infants. They attribute this fact to differences in the ability of the fetus to assimilate calcium rather than to the content of the maternal blood. A marked lowering of the maternal blood calcium may lead to intra-uterine rickets, bony malformations, spasmophilia, and fetal death. In decalcifying processes such as osteomalacia, determinations of the calcium intake and output are necessary; blood-calcium studies are of no value.

During the later months of pregnancy and during normal labor the authors found the serum calcium to be somewhat lower than during the early months of pregnancy. In cases of prolonged labor due to

uterine atony, however, the blood calcium was elevated. They therefore conclude that normal uterine contractions are definitely related to a state of hypocalcemia which leads to increased neuromuscular excitability.

After delivery, the blood calcium rapidly returns to the normal level in spite of the calcium-depleting effect of lactation on the maternal organism. A low blood calcium leads to a lowering of the calcium content of the milk and predisposes to spasmophilia in the infant. An increase in the body weight of the infant depends to a large degree on the calcium content of the milk.

The higher blood-calcium values of the fetus and newborn infant as compared with those of the mother are attributed by the authors to the action of the fetal endocrines.

HAROLD C. MACK, M.D.

Montgomery, T. L.: The Etiology and Significance of Necrosis (Infarction) of the Placenta; a Biological and Histological Study. *Am. J. Obst. & Gynec.*, 1931, xxi, 157.

Necrosis is a physiological phenomenon found to some degree in every full-term placenta which is initiated by degeneration of the syncytium and the deposit of fibrin in the intervillous space.

It appears likely that, during pregnancy, ferments are formed by the maternal tissues as a protection against invasion by the chorionic epithelium, and that these ferments, as constituents of the maternal blood, cause the degeneration of the syncytium.

The successive stages in the progress of necrosis of the placenta are focal necrosis of placental villi, and conglomerate necrosis of placental villi with extensive intervillous thrombosis.

Long-standing areas of necrosis may undergo the following alterations:

1. Disintegration and absorption of the red blood cells, which alter the color of the lesion from red to white (common).
2. Disintegration and absorption of intervillous fibrin deposit, leaving pale, closely compacted, necrotic villi (not uncommon)
3. Autolysis and cyst formation in the center of the necrotic tissue (infrequent).
4. Invasion with monocytes and beginning organization of tissue (rare).

Hæmatomata of the placenta are not of the same nature as the necrotic lesions of the placenta. Hæmatomata result from the rupture of decidual arterioles. They occur most frequently when pregnancy is complicated by chronic nephritis. In their etiology and mechanism of formation they are similar to uteroplacental apoplexy. The two lesions may be present in the same placenta.

Necrosis of the placenta is found no more frequently in pregnancy with toxæmia than in normal pregnancy. There is evidence that infarcts of the placenta may cause toxæmia of pregnancy.

Hæmorrhagic lesions (hæmatomata) of the placenta, however, are associated with nephritic toxæmia.

The term "necrosis" is preferred to "infarction" because the process begins with small areas of tissue death rather than with obstruction of the circulation.

E. L. CORNELL, M.D.

Hendry, W. B.: Hæmorrhage in the Early Months of Pregnancy. *Am. J. Obst. & Gynec.*, 1931, xvi, 211.

Of 610 cases of abortion admitted to the Toronto General Hospital during the last five years, the abortion had been self-induced with mechanical or medicinal agents in the great majority. Other causative factors were retroversion of the uterus, syphilis, toxæmia, subacute salpingitis, decidual endometritis, uterine myomata, pulmonary tuberculosis, deep cervical lacerations, and lobar pneumonia. Resulting complications were uterine infection, secondary anæmia, pelvic inflammation with or without abscess formation, general peritonitis, septicæmia, bronchopneumonia, subphrenic abscess, phlebitis, and pyometra. Complications present were cervical erosion, chronic endocervicitis, cardiac lesions, carcinoma of the cervix, acute cystitis, acute gonorrhœal urethritis, several gastro-intestinal lesions, colloid goiter, ventral hernia, and ovarian cyst.

There were 385 incomplete, 120 complete, 68 threatening, 35 inevitable, and 2 missed abortions. Ninety-seven of the women were found to be infected at the time of their admission to the hospital.

In cases of threatened abortion the treatment consisted of absolute rest in bed and the administration of sedatives to control pain, nervousness, and restlessness. When the abortion was considered inevitable or incomplete, it was completed by the administration of ergot and quinine, packing of the cervix and vagina with iodoform gauze for twenty-four hours, or dilatation and curettage. For curettage, the author prefers the sharp curette to the educated finger or the dull curette.

In all of the infected cases reviewed, conservative treatment was given with the establishment of efficient drainage for localized pus. In cases of infection due to the hæmolytic streptococcus, scarlet fever antitoxin was given intramuscularly when a positive smear was obtained from the cervix and intravenously when the infection had become general. In cases of the latter type blood transfusions were given in addition. The results were encouraging.

Sixty-nine cases of ectopic gestation were admitted to the Toronto General Hospital in the last five years. The youngest patient was nineteen years of age and the oldest forty-two years. The average age was slightly over thirty years. Fifteen of the patients were nulliparæ, 26 were primiparæ, 28 were multiparæ, and 25 had had from 1 to 6 abortions. Eighteen had not missed any menstrual periods, 42 had missed 1 period, 8 had missed 2 periods, and 1 had missed 3 periods. The number of periods missed by 11 was not recorded. The onset of the disturbances was sudden in 21 cases, gradual

in 18, and gradual culminating in a sudden attack in 27. It began with hæmorrhage in 13 and with pain in 53. Fifteen of the patients had had no vaginal bleeding before their admission to the hospital. Thirty-nine gave a history of slight to moderate continuous or intermittent bleeding, for periods varying from a few hours to seven weeks, while 5 had had profuse intermittent bleeding for several days. In 3 cases there was no pain. In 20 cases the pain was slight and cramp-like; in 39, sharp and severe; and in 7, of a dull, aching character. Pain on defæcation occurred in 2 cases, and pain and difficulty in urination were experienced in 2. Nausea and vomiting accompanied the pain in 20 cases. In 25, there were fainting and collapse out of all proportion to the amount of the external hæmorrhage.

Vesicular mole is rare. During the last ten years only 11 cases were admitted to the Toronto General Hospital. Of 8 cases in which the records were complete, hæmorrhage occurred in all. It was described as scant, slight, or moderate and irregular in 4, and as moderate or profuse with clots in 4. The characteristic vesicles were found before operation in only 2. Nausea and vomiting were severe in 4 and absent in 4. The severity of the nausea and vomiting varied inversely with the amount of the hæmorrhage. All of the patients were operated upon. In the cases of 6, careful dilatation and curettage were done. In 1 case, hysterectomy was performed because of the presence of a large fibroma and the patient died three days later from pulmonary embolism.

E. L. CORNELL, M.D.

Pearce, T. V.: Three Hundred Cases of Abortion. *J. Obst. & Gynec. Brit. Emp.*, 1930, xxxvii, 769.

This article is a statistical review of 300 cases of abortion seen by the author in St. Giles' Hospital, London, in a period of two years. Pearce finds that the incidence of abortion is increasing while the birth rate is decreasing, and that about 25 per cent of pregnancies end in abortion.

In 102 of the abortions reviewed, the causes were as follows: shocks or non-local injury, 24 cases; physical disabilities, 9 cases; self-inflicted local injuries (vaginal douches, 18 cases), 28 cases; and poisons and other noxious substances (chiefly pills and purgatives), 41 cases.

The author believes that many of the abortions were caused innocently, the patient not knowing that she was pregnant.

Syphilis seems to have little or no influence in causing abortion as the ratio of abortions to births in the cases of 14 women with a positive Wassermann reaction (1:5.83) was about the same as the ratio of abortions to births in the whole group (1:5.36). Pearce believes that dietary deficiencies and hormone disturbances are probably factors in abortion.

The treatment employed by the author is along accepted lines. In the absence of infection, the uterus is emptied at once when the abortion occurs

early in the pregnancy. When the pregnancy is further advanced, bougies and packing may be used. In infected cases, bacteriological examination is unsatisfactory from the point of view of prognosis. A patient is usually considered septic if her temperature rises to 100.4 degrees F. or if it remains at 99.4 degrees F. or higher on three successive days. Sepsis is an indication that the uterus is not empty. Evacuation of the uterus should be done very gently, preferably with the finger or the ovum forceps guided by the finger, and should be followed by an intra-uterine douche of eusol solution. In highly septic cases a eusol douche may be given once or twice before the evacuation, at intervals of twenty-four hours. In the cases reviewed, echolics, as usually employed, were found uncertain in their action, but transabdominal intrafudral injections of pituitary extract were given many times after the evacuation of the uterus to stimulate uterine contraction. Sera and intravenous administration of eusol proved of uncertain value.

E. L. KING, M.D.

LABOR AND ITS COMPLICATIONS

Probstner, A. von: Five Cases of Uterine Rupture Following the Improper Administration of Pituitary Preparations (Fuenf Paelle von Uterus-rupturen zufolge unrichtiger Dosierung von Hypophysenpraeparaten). *Med. Klin.*, 1930, ii, 1785.

The author presents a critical study of five cases of rupture of the uterus following the administration of extract of the posterior lobe of the pituitary gland in the absence of the proper indications. He emphasizes that it is fundamentally incorrect to use this hormone to shorten the duration of labor so long as there are normal uterine contractions. Its use is contra-indicated also in the presence of weak uterine contractions since inertia is very often due to only a transient physiological relaxation of the uterine musculature during labor.

All of the cases reviewed were those of elderly multiparae—cases in which the structure and resistance of the uterus had been weakened by numerous previous labors. Moreover, in every instance there was either an abnormality in the position of the fetus or a pelvic anomaly, factors which in themselves prolong labor and increase the danger of uterine rupture. Three of the infants were post-mature. Only one had the normal length of 50 cm.; the others measured from 54 to 57 cm. Only one of the women could be saved by operation (supravaginal hysterectomy). Three died on the operating table from severe hemorrhage, and one died three days after operation from sepsis. All of the patients were transferred to the clinic several hours after the occurrence of the uterine rupture. In every instance the rupture involved the lower segment of the uterus. All of the case histories showed, not only that the extract of the posterior lobe of the pituitary gland had been given at the wrong time, but also that it had been administered in excessive and too frequent doses and often intravenously. All of the patients

had a contracted pelvis. Three had a cephalic presentation and two a transverse presentation. It is therefore easily understood why the lower segment of the uterus, over-distended as a result of the lack of engagement of the head, should rupture after the injection of the pituitary extract.

The signs of rupture were the well-known classical signs. It was characteristic also for the fatal hemorrhage to occur after delivery (accomplished after craniotomy in cases of cephalic presentation), since before delivery the site of the rupture was compressed by the fetus.

Experience alone must determine whether Temesvary's thymophysin (a combination of extract of thymus with extract of the posterior lobe of the pituitary gland) will diminish the danger of uterine rupture and will be less dangerous to the child. It is believed that the addition of thymus extract will prevent the tetanic contractions which occur when extract of the posterior lobe of the pituitary gland is used alone and are a source of danger to both mother and child. International standardization of the extract of the posterior lobe of the pituitary gland according to the so-called Voegtlin units permits a better calculation of the dosage of this preparation.

During labor, only intramuscular or subcutaneous injections should be given. Intravenous injections are permissible only when the head reaches the outlet since at this stage rapid interference is possible in the event of fetal asphyxia. Even in the third stage of labor, moderation and care are essential in the use of pituitary extract. Too rapid separation of the placenta and too vigorous uterine contraction after expulsion of the placenta are contrary to the physiology of this stage of labor and often lead to late uterine atony.

Other contra-indications to the use of pituitary extract besides those already mentioned are cardiac and renal conditions and eclampsia.

In conclusion the author says that the physician who uses pituitary extract should remain with the patient until there is no longer any danger of an untoward effect from the drug. Experiment with pituitary extract should be carried out only in clinics, never in private practice.

F. SIEGERT (G).

Hartemann, J.: Artificial Dilatation of the Cervix under Spinal Anæsthesia (Dilatation artificielle du col sous rachianesthésie). *Bull. Soc. d'obst. et de gynec. de Par.*, 1931, xx, 70.

Hartemann reports a series of twenty-two cases in which artificial dilatation of the cervix was done under spinal anæsthesia to expedite delivery or facilitate extraction. The cases are divided into two groups, one in which the artificial dilatation was done before and the other in which it was done after the onset of labor. Of the five women in the first group, three suffered from eclampsia in the eighth month of pregnancy, one had meningitis, and one had uteroplacental apoplexy with intra-uterine death of the fetus. The woman with uteroplacental apoplexy died following delivery, but her death was

not attributed to the method of delivery. Dilatation to an extent permitting introduction of the hand within the cervix was easily attained. However, in two cases it was not sufficient to permit extraction of the after-coming head without great difficulty. Two premature infants (seven and a half months) succumbed shortly after birth. Deep bilateral cervical lacerations resulted in every instance. In one case the tear extended to the cul-de-sac. Grave conditions such as eclampsia threatening the life of the mother are considered indications for artificial dilatation of the cervix. Because of the damage to the cervix, the procedure is contra-indicated in other conditions as long as the cervix is not completely effaced or is only partly dilated.

In the seventeen cases in which the artificial dilatation was done after the onset of labor the indications included dystocia with symptoms of maternal exhaustion, fetal distress, premature rupture of the membranes with intrapartum infection, albuminuria with hypertension, eclampsia, prolapse of the umbilical cord, and cardiac decompensation. All of the patients were primiparæ. Dilatation was effected easily, but was never complete, a small resistant anterior ring remaining in every instance. In thirteen cases delivery was accomplished with forceps, in one case by version and extraction, and in three cases by breech extraction. Because of the relaxation of the perineal muscles, forceps delivery usually presented no difficulties and perineal lacerations occurred in only two cases. Version and extraction and breech extractions presented greater difficulty because of the contraction of the lower uterine segment caused by the spinal anesthesia. Five of the seventeen infants were stillborn, one because of prematurity complicated by eclampsia in the mother, one following prolapse of the umbilical cord, one following the application of forceps for fetal indications, and two after delivery by the breech.

As a rule there was no appreciable delay in the third stage. The puerperium was febrile only in cases with a previously existing intrapartum infection. The ultimate results were favorable. A prolonged and alarming excitement stage, attributed to the spinal anesthesia, was controlled by the intravenous administration of adrenalin.

The author advises caution in the establishment of the indications for the procedure.

HAROLD C. MACK, M.D.

Calkins, L. A., Litzberg, J. C., and Plass, E. D.: The Management of the Third Stage of Labor with Special Reference to Blood Loss. *Am. J. Obst. & Gynec.*, 1931, xxi, 175

It appears that age and parity have no effect on the blood loss at delivery. The duration of labor, except for the length of the third stage, is also without a demonstrable influence. The important and uncontrollable factors materially influencing blood loss are the stature of the mother and the stature of the child. These factors and the duration of the third stage of labor seem to account for most of the

variations in blood loss in women delivered spontaneously and without severe laceration.

The technique employed by the authors for the management of the third stage of labor is as follows:

Immediately upon the birth of the baby the fundus is carefully located and is held constantly until the placenta is separated and expressed and bleeding is thoroughly controlled. Massage of the uterus is avoided unless there is evidence of considerable softening or bleeding. Of the signs of placental separation, beginning bleeding (excluding cervical bleeding) seems to be the most important. As soon as there is evidence of placental separation, the placenta is expressed by squeezing the uterus and making moderate downward pressure. In the large majority of cases the separation takes place in from one to five minutes. Immediately after delivery of the placenta firm contraction of the uterus is induced by the hypodermic administration of pituitrin and moderately vigorous massage of the uterus. The massage is probably more important than the pituitrin. The uterus is watched closely for at least an hour following delivery. In some cases ergot is given. At the end of one hour all clots are expressed from the uterus and vagina.

The authors believe that if this technique is carefully carried out the average loss of blood will not exceed 500 c.cm.

E. L. CORNELL, M.D.

MISCELLANEOUS

Mudaliar, A. L.: Double Monsters—A Study of Their Circulatory System and Some Other Anatomical Abnormalities—and the Complications in Labor. *J. Obst. & Gynec. Brit. Emp.*, 1930, xxxvii, 753.

The author describes the anatomical abnormalities observed in nine specimens of double monsters collected in the museum of the Gifford School of Obstetrics, Madras, India. He attended the delivery of four of the monsters. Three were specimens of thoracopagus tetrabrachius tetrapagus; two were specimens of thoracopagus tribrachius dipus; one was an anencephalic thoracopagus dibrachius dipus; one, a syncephalic thoracopagus tetrabrachius tetrapagus; one, a craniopagus; and one, an ischiopagus.

The anomalies of the circulatory and digestive systems are discussed in detail and other anomalies found are described.

Attention is called to the fact that in dicephalic thoracopagus monsters there are certain marked types of cardiac anomalies which make a morphological classification possible. At one end of the series are the monsters with fused hearts containing only one auricle and one ventricle, while at the other end are those with two completely separate hearts, sometimes in a common pericardium. Between these extremes are many types of anomalies.

The history of these monsters is discussed in detail. The diagnosis is not made before labor. However, a roentgenogram may suggest the condition

because of the relative positions of the twins, even though there is no bony union. Dystocia is of course frequent, and embryotomy is often necessary. Such monsters have been born alive and have lived to maturity. Operative separation has been performed, but has seldom been successful. The possibility of separation is dependent of course upon the degree and nature of the union. E. L. KING, M.D.

Greysell, J., and Boyer, C.: Syndromes of Massive Intraperitoneal Hæmorrhage Due to Perforation of the Uterus by Malignant Chorionepithelioma (Des syndromes d'inondation péritoneale par perforation utérine consécutive à l'évolution du chorio-épithéliome malin). *Gynéc. et obst.*, 1931, xxiii, 1.

The authors report a case in which death resulted from massive internal hæmorrhage caused by perforation of the uterus by a malignant chorionepithelioma. Intraperitoneal hæmorrhage due to this cause is seldom mentioned in textbooks on account of its comparative rarity, but the authors have been able to collect eighteen well-authenticated cases from the literature. According to the statistics of Ladinski, it occurs in 4 per cent of all fatal cases of chorion-epithelioma and as a rule takes place quite early in the course of the disease. The predisposing factors are problematical, but the most probable cause is uterine trauma from curettage or attempted abortion. The perforation usually occurs at or near the fundus of the uterus. It measures 1 or 2 cm. in diameter and is characterized by irregular, widely gaping edges. Metastases are rarely present when it occurs.

The symptoms are typical of intraperitoneal hæmorrhage. A sharp pain in the lower abdomen is followed quite rapidly by the development of intense anæmia, a rapid pulse, abdominal rigidity, and shock. The diagnosis is based on these symptoms, enlargement of the uterus, and a history of metrorrhagia following normal pregnancy, abortion, or, most often, the expulsion of a hydatidiform mole. Uterine enlargement in association with signs and symptoms of internal hæmorrhage serves to differentiate the condition from ruptured tubal pregnancy. Extra-uterine pregnancy associated with uterine fibroids or intra-uterine pregnancy is ruled out with greater difficulty. The taking of the history and the physical examination are often rendered difficult by a precarious general condition.

The prognosis is usually extremely grave because of the secondary anæmia. Of the eighteen patients whose cases have been collected by the authors from the literature, two died before operation, eight died immediately after operation, and only one survived operation longer than two years. Although only 50 per cent of those subjected to surgery survive the operation, the authors believe that immediate intervention is indicated in all cases, not only to control the hæmorrhage but also in the hope of effecting an ultimate cure. Spontaneous cessation of the hæmorrhage can hardly be expected. When operation is decided upon it must be performed immediately, even in the presence of shock. It must be done rapidly and must be radical. The procedure of choice is hysterectomy followed by radium or roentgen irradiation. HAROLD C. MACK, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Asti, M. L.: Considerations Regarding the Value of Intravenous Pyelography with Uroselectan in the Roentgen Study of the Kidney and Its Cavities (Considerazioni sul valore della pielografia endovenosa con l'uroselektan nell'indagine radiologica del rene e delle sue cavità). *Radiol. med.*, 1931, xviii, 42.

The author describes the technique and indications of intravenous pyelography with uroselectan and discusses the advantages and results of the procedure. As the literature reports a considerable number of cases in which the pyelogram was indistinct or failed to indicate the condition of the renal cavities as revealed later by other methods or at autopsy, it is necessary to determine the type of cases in which the results will be satisfactory.

Asti has found that good pyelograms are obtained especially in cases of obstruction to the flow of urine, congenital malformations, topographical changes, hypertrophy of the prostate, urethritis, cystitis, and pyelitis, and in the cases of pregnant women and small children. The conditions in which the method has proved unsatisfactory include tuberculosis of the kidney, hydronephrosis, polycystic kidney, and renal tumors.

In the evaluation of a new method of examination it is necessary to give greater consideration to the cases in which the results have been negative or insufficient rather than those with positive findings, since the negative results may be interpreted as indicating a pathological condition.

The author reports the results obtained in the Radiological Institute of Milan in the cases of eighteen patients, most of whom were being treated in the Cancer Institute of Victor Emanuel III for advanced cancer of the uterus. In some of these cases the diagnosis was checked by ascending pyelography and in others by autopsy.

Asti concludes that the findings of pyelography following the intravenous injection of uroselectan should always be checked, if possible, by retrograde or ascending pyelography. It cannot take the place of instrumental pyelography, but is a valuable supplement to the latter. It should be used in all cases in which ascending pyelography is contra-indicated or impossible.

WILLIAM W. WHITELOCK, Ph.D.

Bronner, H., and Schueller, J.: Excretion Pyelography with Abrodil. *Surg., Gynec. & Obst.*, 1931, lxi, 254.

Following the introduction of uroselectan in the Frangheim Clinic by Swick and von Lichtenberg, the authors introduced abrodil in that clinic. Abrodil has now been used in a series of 100 cases with reliable results.

Abrodil is the sodium salt of iodomethanesulphonic acid. Fifty-two per cent of it is very firmly organically bound iodine. Its molecular weight is 244. It is 70 per cent soluble in water at room temperature, and has a neutral reaction.

In pharmacological tests to determine its toxicity, rate of excretion, stability, and effect on the kidney tissue, mice, rabbits, and dogs were used. The drug was well tolerated even in large doses. The rate of excretion was very rapid. In the case of a dog weighing 15 kgm. which received 10 gm. of abrodil intravenously, 47 per cent of the drug was excreted in the urine during the first hour, 76 per cent after three hours, 89 per cent after nine hours, and 93 per cent after twenty-four hours. The histological examinations of the kidney by Domagk after very heavy doses showed only transient tubular changes. Doses as large as these would not be used in clinical cases.

The standard dose for clinical use is 20 gm. of abrodil dissolved in a sufficient quantity of distilled water to make a 20 to 30 per cent solution. Before use the solution is filtered, sterilized, and warmed to body heat. The injection is made into the median cephalic vein and requires between two and three minutes. A burette or syringe with rubber tubing between the needle and syringe is employed. With the exception of a very uroepic patient who received 30 gm., all of the patients were able to walk out of the X-ray room after the examination. Abrodil may therefore be used for ambulatory patients. Pregnant women and tuberculous patients are not affected by it. It seems to be contra-indicated only in cases of very severe kidney insufficiency.

In cases in which the kidneys were normal, a 2 per cent content of iodine in the urine was reached after from five to twenty-five minutes. When a larger dose was given no marked difference was noted, but the excretion was prolonged. As long as the kidneys excrete over 2 per cent, a good roentgenogram may be expected. Diuresis is diminished after from one-half to one hour. As a rule the best roentgenograms are obtained from fifteen to twenty minutes after the injection, when diuresis and the iodine content of the urine are greatest.

When the function of the kidneys is very defective, excretion is delayed. Not infrequently it is necessary to wait for from five to ten hours before a satisfactory pyelogram can be made.

The authors do not believe that the quantitative excretion of abrodil makes an ideal functional test as other tests are accurate and easier.

In conclusion the authors state that abrodil is an ideal solution for pyelograms made with the use of ureteral catheters. It causes less local irritation

than sodium iodide. In fresh solution it is compatible with solutions of mercury oxycyanate and a 1 per cent solution of silver nitrate. A 15 to 20 per cent solution is recommended except for very obese patients, for whom a 30 per cent solution may be necessary.

CLAUDE D. PICKRELL, M.D.

Astraldi, A.: Congenital Renal Hypoplasia (Hypoplasie rénale congénitale). *Arch. urol. de la clin. de Necker*, 1931, vii, 47.

The author emphasizes that in a study of congenital renal hypoplasia it is essential to differentiate between hypoplasia and atrophy. In atrophy, the size of the kidney has been reduced by some influence such as an inflammation or a vascular lesion. Hypoplasia is the smallness of a kidney which has developed to the limit of its possibilities, but has not attained normal size.

A kidney of reduced dimensions may present, in addition to its small size, malformations of manifestly congenital origin affecting its excretory channels or its blood vessels, or it may present no other apparent anomaly besides its small size.

Following a detailed review of the literature, the author summarizes as follows:

1. It is impossible to determine a size below which a kidney may be considered hypoplastic.
2. The congenital nature of the two varieties of hypoplastic kidney mentioned has been demonstrated.
3. There is no case on record in which the presence of renal hypoplasia has been demonstrated by functional examination. It is believed that in the second variety mentioned, the yield of substances both proper and foreign to the organism is less than the normal yield. Therefore Ambard's constant might be used in the diagnosis.
5. Only five cases of the second variety of renal hypoplasia have been reported—those seen by Ménétrier, Stefani, Grueber and Kratzen, Pfeiffer, and Papin.

WILLIAM W. WHITELOCK, Ph.D.

Giraud, D.: Renal Vascularization, Its Relation to Surgical Affections and Surgery of the Kidney (*De la vascularisation rénale, ses rapports avec les affections chirurgicales et la chirurgie du rein*). *Arch. d. reins et d. organes genito-urinaires*, 1931, v, 511.

The author seeks to show, on the basis of an exposition of the complicated vascularization of the kidneys, the dangers and limitations of renal surgery and the precautions that are essential in operations on the kidney.

Injury to any one of the elements of the kidney will produce an effect on the vitality of the parenchyma and renal function. From the surgical point of view, it is important to study each of the vessels outside of and within the parenchyma. The vessels outside of the parenchyma may be studied macroscopically by dissection, but for the study of those within the parenchyma the injection of salts opaque to the roentgen rays is necessary.

In general it may be said that the kidney receives its arteries from the nearest trunks. The diameter of the renal arteries is classically fixed at 8 mm., but in reality is not constant nor always the same on the two sides. As regards the arteries, the renal pelvis is more accessible from the posterior surface than from the anterior surface. Access to the calyces, on the other hand, is equally difficult from both the anterior and the posterior surfaces. Posterior pyelotomy may spare the arterial vascularization of the kidney, but anterior pyelotomy endangers it. Opening of the calyces by either a posterior or an anterior approach is practically impossible.

Whether the intraparenchymatous branches come from the prepyelic or retropylar artery, they have a like course. Dissection is possible only in their initial portion. To study them it is necessary to inject a special mixture into the vessels and then digest the organ by corrosion or to inject the vessels with a fluid opaque to the roentgen ray and then make roentgenograms. The arteries never anastomose within the kidney; they are terminal. Consequently there is no subpyramidal arterial arch, the interlobular or peripyramidal arteries are independent of each other, the interlobular arteries do not anastomose, and the region of the prepyelic artery is independent of the region supplied by the retropylar artery.

Recognition of abnormal polar arteries is important because such vessels often cause difficulty in nephrectomy and in conservative operations such as pyelotomy and nephrotomy, and play an important part in the pathogenesis of hydronephrosis. It has been found possible to ligate and divide such arteries without causing complications.

As the renal arteries are terminal, their section always produces necrosis. When the necrosis is aseptic, it causes no symptoms, but when it is septic the resulting disturbances may render nephrectomy necessary.

The closeness of the inferior vena cava to the right kidney and the shortness of the pedicle of the right kidney render nephrectomy more difficult on the right side than on the left side.

The renal veins have five branches which may also present anomalies. Anomalies of the renal veins are more frequent on the left side than on the right side. Accessory veins often accompany the polar arteries, but may be present alone. An abnormal polar vein may be divided without causing marked disturbances if the renal vein is uninjured. Such a vein alone is of insufficient size to drain all of the blood supplied by the artery.

Theoretically, obliteration of the renal vein is not so serious as obliteration of the artery, but if the renal vein is injured or ligated during the course of a conservative operation, re-establishment of the circulation cannot be counted on. In the kidney, as in the limbs, time is necessary for the formation of vascular anastomoses. Therefore any obstruction to the circulation must be slow and progressive, not abrupt.

WILLIAM W. WHITELOCK, Ph.D.

Söderlund, G.: A Contribution on the Problem of the Roentgen Diagnosis of Renal Tuberculosis (Beitrag zur Frage ueber die Roentgendagnostik der Nierentuberkulose). *Acta chirurg. Scand.*, 1931, lxxvi, 491.

The author reviews 162 cases of renal tuberculosis examined with the roentgen rays—161 cases seen in the Maria Hospital in the period from 1912 to 1925 and 1 case from the Serafimer Hospital. In 52 cases the roentgen examination gave positive findings, and in 29 of these it was of definite value in the diagnosis or treatment. The author divides the 29 cases into the following 6 groups:

Group 1. Six cases. Both ureters were catheterized. No tubercle bacilli were found in the urine from either the bladder or the ureters. No definite tuberculous changes were discovered in the bladder.

Group 2. Four cases. Only the ureter of the healthy kidney was catheterized. No tubercle bacilli were found in the urine from either the bladder or the ureter. No definite tuberculous changes were found in the bladder.

Group 3. Four cases. In 3 cases catheterization was done on only 1 side. Pus and tubercle bacilli were found in the urine. In 1 case catheterization was done on both sides. Tubercle bacilli were found in the urine from only 1 side, but X-ray examination showed that the kidney on the other side was also tuberculous.

Group 4. Six cases. Cystoscopy was impossible on account of stricture or narrowing of the urethra.

Group 5. Four cases. Catheterization of the ureters was impossible because of changes in the bladder.

Group 6. Five cases. These were cases of closed renal tuberculosis. At the time of the examination the tuberculous process in the kidney had no communication with the bladder.

In 42 of the 52 cases with positive roentgen findings, shadows of calcification due to the tuberculous process were seen in the roentgenogram at sites corresponding to the kidney and ureters, and in 31 of these they were sufficiently characteristic to permit a diagnosis of renal tuberculosis without consideration of the clinical findings. In 2 cases the nature of the shadows was uncertain, and in 9 cases the roentgen picture seemed more like that of lithiasis. In 1 case there was a contraction of the renal shadow at the hilus and the lower pole, and in 1 case pyelography established the presence of a cavity. In 2 cases cavity formations were recognized from double contours of the renal shadow. In 1 case, the ureter appeared thickened. In 2 cases, dilatation of the renal pelvis, and in 3 cases, enlargements of the renal shadow on the affected side were found.

Filippa, C., and Vitale, A.: An Experimental Contribution to Our Knowledge of Ureteral Antiperistalsis (Contributo sperimentale alla conoscenza dell' antiperistalsi ureterale). *Polidini*, Rome, 1931, xxxviii, sez. chir. 30

By the term "ureteral antiperistalsis" is understood the passage of peristaltic waves from the lower

portion of the ureter toward the kidney. The authors' researches had as their principal aim the determination of the possibility of an ascending infection by means of the vesico-ureteral reflux. This possibility is important since one of the conditions rendering an ascending infection difficult is the rhythmic and timely peristaltic movement which, starting from the kidney, passes down to the bladder.

It is known that every peristaltic wave is the result of two muscular synergistic contractions due to the external circular fascia and the external longitudinal fascia. However, the mechanism of the progression of the wave is still somewhat obscure. There are two main hypotheses regarding the genesis of ureteral peristalsis: the myogenic (without nervous participation) and the neurogenic. There appear to be connections between the extrinsic and intrinsic nervous systems, but the integrity of the intrinsic nervous system is essential not only for the production of the wave but also for its progression. Any cause which creates an obstacle to progression of the peristaltic wave may lead to hydronephrosis. Among numerous other factors influencing the movements of the ureter are the temperature, the composition of the blood, variations in intra-abdominal pressure, contractions of the diaphragm, pulsations of large vessels, and intestinal movements.

The authors' studies of ureteral antiperistalsis were restricted to direct observations since it has been shown that the graphic method of recording peristalsis records also extraneous movements such as muscular and respiratory movements. Fifteen experiments were carried out on dogs. From the results the authors conclude that ureteral antiperistalsis is a rare phenomenon difficult to demonstrate. It occurs most frequently in the presence of a pathological condition and of irritation induced by foreign bodies.

WILLIAM W. WHITELOCK, Ph.D.

Ormond, J. K.: Plastic Surgery of the Ureter. *J. Urol.*, 1931, xxv, 117.

Most plastic operations on the ureter fall into two classes: (1) those performed for the purpose of diverting the urine, which are usually done on the lower ureter, and (2) those performed to relieve obstruction, which are usually done on the upper ureter.

Plastic operations on the lower ureter are done to divert the urine from the bladder, re-establish entrance of the urine into the bladder by a new route or by repair of the normal route, relieve obstruction, or correct certain congenital abnormalities.

The operations classed as plastics on the lower ureter are: (1) implantation into the bowel, (2) re-implantation into the bladder, (3) inguinal ureterostomy, (4) excision or incision of stricture and repair of the ureter, (5) repair of a ureter severed accidentally, and (6) Hunman's plastic shortening of the tortuous and redundant ureter.

Ormond discusses uretero-enterostomy and states that there is a difference of opinion as to the indica-

tions for this operation. He believes it is indicated in extrophy of the bladder, cases of carcinoma of the bladder in which the bladder is excised without being opened, inoperable carcinoma of the bladder (in which the transplantation would be done merely for relief of the symptoms and may be followed by large doses of radium), advanced interstitial cystitis, and intractable and incurable vesical tuberculosis.

With regard to the operation of re-implantation of the ureter into the bladder, some surgeons who have had considerable experience state that in nearly all cases there is stricture formation with consequent infection and destruction of the kidney, whereas others have not noted these sequelae. In this operation it is most important to allow the ureter to project into the bladder for some distance. No attempt should be made to anastomose the opening of the ureter to the bladder mucosa.

Repair of the ureter may be rendered necessary by accidental injury in the course of a pelvic or other operation, or by the excision or incision of a stricture.

The operation of choice for the relief of the symptoms of incurable and intractable vesical tuberculosis in elderly or weak patients is inguinal ureterostomy. In the cases of younger and stronger patients a bowel implantation may be preferred.

Plastic surgery of the upper ureter is done usually for the relief of obstruction. The chief conditions in which it is indicated are stricture of the upper ureter, kinking of the upper ureter (which may or may not be due to aberrant vessels), stricture of the ureteropelvic junction, abnormal implantation of the ureter into the pelvis, and kinking of the ureteropelvic junction.

Except in cases of stricture close to the ureteropelvic junction, the treatment of stricture of the upper ureter is essentially the same as that for stricture of the lower ureter. However, strictures in the upper part of the ureter are more difficult to dilate.

True kinks may be caused by aberrant vessels or by nephroptosis. As section of aberrant vessels undoubtedly causes degeneration of a portion of the kidney, some surgeons section the ureter and re-implant it into the pelvis on the other side of the vessel.

With regard to the advisability of attempting a plastic operation at the ureteropelvic junction, Ormond comes to the following conclusions:

1. Plastic operations on the ureteropelvic junction are indicated in selected cases.
2. Nephropexy should be done in most cases.
3. Catheter splinting of the ureter according to Peck's method should be employed in most cases.
4. A pyelographic examination of the supposedly uninvolved kidney should be a part of the diagnostic procedure in every case of hydronephrosis.
5. When the kidney is markedly damaged, nephrectomy is probably more advisable than a plastic operation unless the other kidney is damaged or shows an early stage of the same condition.

6. In the cases of elderly patients with normal function of the other kidney nephrectomy is to be preferred to a plastic operation.

7. In cases of aberrant vessels, section should be done if the vessels are small, and transplantation of the ureter to the other side of the vessels if the vessels are large.

JACOB S. GROVE, M.D.

Wharton, L. R., and Hughson, W.: Denervation of the Ureter. A New Operation for the Cure of Persistent Painful Ureteral Spasm. Report of Cases. J. Urol., 1931, xxv, 145.

The authors report in detail two cases of persistent and severe ureteralgia. In the first case the pain developed a month after removal of the other kidney for tuberculosis. Conservative measures were tried, but failed to give permanent relief. In the second case the pain came on insidiously after a fall. There was no evidence or history of renal infection, but a definite hydro-ureter and hydronephrosis were found. In both cases ureteral denervation resulted in permanent cure. One patient has now been well for almost six years, and the other for three and a half years.

The findings in the ureters excluded organic obstruction and stricture and suggested a persistent state of spasticity. In neither case was the denervation followed by evidence of ureteral or renal dysfunction. The marked decrease in sensitiveness of the ureter after the denervation was shown strikingly by postoperative urological studies.

JACOB S. GROVE, M.D.

BLADDER, URETHRA, AND PENIS

Dragonas, E.: A Study of the Functioning of the Vesical Musculature and the Mechanism of Opening of the Neck of the Bladder in Normal Micturition (Etude sur le fonctionnement de la musculature vésicale et le mécanisme de l'ouverture du col dans la miction normale). Arch. urol. de la clin. de Necker, 1931, vii, 17.

The trigone, which has been regarded by some as the dilating muscle of the neck of the bladder, does not have a dilating action. Its anatomical structure and the mechanical conditions surrounding it preclude such a function. Moreover, there are no phenomena indicating this function since all of the phenomena observed in urethroscopy and cysto-urotography are explained by the structure of the vesical muscle and the mechanism resulting from its contraction.

The great dilator of the neck of the bladder is the external longitudinal layer, particularly the posterior longitudinal band. The rôle of the plexiform layer is less important. The posterior longitudinal band pulls back the posterior arc of the neck of the bladder, while the anterior group fixes the anterior arc.

The contents of the bladder undoubtedly play a part in the opening of the neck of the bladder, but the hydraulic pressure may be regarded as only the direct result of the contraction of the vesical muscu-

lature. The hydraulic pressure resulting from abdominal effort can act only under certain conditions to which the bladder may be subjected. In normal micturition, these conditions are realized by contraction of the vesical muscle.

The entire process is intimately related to dynamic force, to the contractility of the vesical muscle which is able to respond to all the demands of the mechanism. When the dynamic force is disturbed the mechanism is likewise disturbed. The bladder is therefore not an inert organ. It makes use of mechanical laws, directing them according to its need.

WILLIAM W. WHITELOCK, F.R.C.D.

Leguen and Dossot: "Dyssectasia" of the Neck of the Bladder (*La dysectasie du col vésical*). *Presse méd.*, Par., 1931, xxxii, 89.

The authors discuss retention of urine due to factors inhibiting the opening of the neck of the bladder. For this condition they propose the name "dyssectasia." They discuss the etiology, urethroscopic appearance, and mechanism of dyssectasia.

Dyssectasia may be caused by lesions of the neck of the bladder or affections of the nervous system. The causative lesions in the bladder are tumors and infections. The tumors include benign hypertrophy and carcinoma of the prostate. In the authors' cases the most frequent cause was benign hypertrophy of the prostate. Small adenomata of the prostate were often responsible for the most marked retention of urine. In the authors' opinion, the action of lateral lobe compression and median lobe valve action are of little importance as in all cases in which they are present a large sound passes easily.

In infections of the neck of the bladder, a prostatic abscess will produce acute retention, but this is relieved when the abscess is evacuated. Other infectious conditions of the bladder neck that may cause dyssectasia are chronic infections secondary to chronic posterior urethritis, cystitis, and chronic prostatitis, stricture of the urethra, congenital inflammatory lesions (Marion), and muscular hypertrophy (Young).

Affections of the nervous system leading to dyssectasia include local nervous disturbances with loss of control causing transient retention, such as may follow cystoscopy, lithotripsy, or urethral dilatation; reflex nervous disturbances due to operations such as appendectomy, hemorrhoidectomy, the repair of hernia, and operation for anal fissure; and conditions of the central nervous system such as tabes, spina bifida, and the irritation following intradural injections.

The vesical neck with dyssectasia may show one or more of the following changes: edema, thickening, inflammatory sclerosis, hypertrophy of the glands, or adenomata.

During urination under normal conditions, the anteroposterior and lateral walls of the neck of the bladder straighten and expand slightly and the postero-inferior wall quickly forms a deep gutter. When the patient with dyssectasia strains as in

urinating, the neck of the bladder responds in one of the following ways:

1. It remains immobile.
2. The anterior and lateral walls respond normally, but the posterior wall sinks slowly and does not form a gutter.
3. The posterior wall forms a gutter, but remains inert although the straining is continued.
4. The neck begins to open, but despite straining, assumes the resting state.
5. A large rounded red pad overhangs the prostatic fossa and there is no contraction of the walls of the neck of the bladder.

In conclusion the authors state that a complete cure can be obtained by surgical ablation of the vesical neck. They have found this procedure superior to forced dilatation or dissociation of the vesical neck.

JAMES B. MASON, M.D.

Mathews, R. F.: Bladder Tumor: A Survey of Fifty Cases. *Am. J. Surg.*, 1931, xi, 343.

Bladder tumors are more common in the male than in the female. The author classifies them clinically into three groups—the pedunculated, the sessile, and the infiltrating. Infiltrating tumors always arise from the surface epithelium, whereas sarcomata have their origin beneath the surface epithelium. Eighty-five per cent of the benign growths are papillomata. Less frequent are adenomata, fibromyomata, and myxomata. The most common malignant tumors of the bladder are malignant papillomata, papillary carcinomata, adenocarcinomata, and epitheliomata.

The benign papilloma begins as a tiny excrescence with a core of connective tissue but no muscle. When a papilloma becomes malignant the epithelial layers thicken and multiply and the papillae fuse. The malignant papilloma is a papillary carcinoma.

Bladder tumors are most frequent in the region of the trigone and ureteral orifices. In malignancy, inflammatory areolae are noted. The neoplasm becomes stony hard and infiltrates and ulcerates.

The adenocarcinoma is rare, its incidence being only 2 per cent. It is always found at the base of the bladder near the trigone. It may have a thickened pedicle, and it looks like a mushroom. It frequently shows ulceration.

In epithelioma, the strands of tumor tissue penetrate and heap up on the surface. The layer of connective tissue between the nests of malignant cells is not thin. Pearls form in the center of the nests. The clusters are squamous or of the basal-cell type. The neoplasm spreads laterally and is flat and sessile.

Sarcomata, fibromata, and dermoids are rare. The incidence of sarcoma is less than 1 per cent. The sarcoma is sessile and shows round, mixed, or spindle cells. Fibromata are pedunculated. They show no infiltration or ulceration. Dermoid tumors are generally single and show protruding hair.

The secondary effects of bladder tumors include bleeding, obstruction, pain, necrosis, ulceration, stone formation, and infection. Ulceration is due to

infection and pressure. Metastasis usually occurs late. Bleeding is the most frequent sequela. It is painless and recurrent. Cystoscopic examination should be delayed until the bleeding stops. The high-frequency current is a very effective hemostatic. Pain is a late symptom. It is due to pressure, cystitis, or blood clots. It usually signifies malignancy too advanced for radical treatment.

The chief aid in the diagnosis of bladder tumors is the cystoscope. X-ray examination is of little value. In cases of ulcerating tumors, specimens must be taken.

The treatment depends upon the findings of cystoscopic examination. The author divides tumors of the bladder into groups according to pedunculation, infiltration, ulceration, elevation, and number of neoplasms.

The treatment of choice is fulguration with the high-frequency current through the cystoscope or a suprapubic incision. Good results have been obtained also from the use of radon seeds implanted from above and left in place for five days. In cases of advanced malignancy, palliative treatment with suprapubic cystotomy is indicated. The X-ray may be employed for palliation. Multiplicity of tumors requires fulguration by open operation. The author operates under caudal anesthesia supplemented by suprapubic field block. BENJAMIN F. ROLLER, M.D.

Bompert, H.: The Value and Indications of Total Cystectomy for Cancer (Valeur et indications de la cystectomie totale pour cancer). *Arch. urol. de la clin. de Necker*, 1931, vii 77.

On the basis of 111 cases of cancer of the bladder treated by total cystectomy which have been reported in the literature, the author draws the following conclusions:

1. The indications for total cystectomy should be extended and the operation performed sooner after the diagnosis is made.

2. Anastomosis of the ureters to the intestine should be abandoned. The only prudent procedure is cutaneous ureterostomy.

3. The derivation of the urine by ureterostomy should be done in a first-stage operation except perhaps when the cystectomy is performed very early, before dilatation of the ureters has occurred.

4. After the operation, periodical lavage of the renal pelvis should be done to prevent pyelo-ureteral infection. This is facilitated by the cutaneous ureterostomy.

5. When the operation is performed under the proper conditions the immediate results may be good and in a considerable number of cases it will be followed by prolonged survival.

WILLIAM W. WHITELOCK, Ph.D.

Campbell, M. F.: Obstruction of the Posterior Urethral Valve in Infancy and Childhood. *J. Am. M. Ass.*, 1931, xcvi, 592.

Congenital infravesical obstruction is due most commonly to urethral valves. As a rule the valves

are attached to the verumontanum. They may be low ridges, mucosal folds which balloon into cusps, or partial or complete diaphragms, the latter with a minute opening. They may pass from either end of the verumontanum to the lateral urethral walls and may be multiple. They are usually on the floor of the urethra. When the verumontanum bifurcates anteriorly a deep pouch is often formed at the apex of the fork, the passage of instruments being thereby rendered very difficult or impossible.

The valves have been ascribed to hypertrophy of normal urethral folds, persistence of the urogenital membrane, anomalous Wolffian or Muellerian ducts, and fusion of the colliculus with epithelium of the posterior urethral roof.

The pathological changes are those common to all infravesical obstructions. The proximal urethra is dilated. The bladder becomes decompensated, dilated, trabeculated, and inflamed. A vesico-ureteral reflex follows, and the ureters become markedly dilated. Renal function is reduced by compression nephritis plus infection.

The symptoms are those of urethral blockage and uræmia. Urinary frequency is common from birth. In many cases there is dysuria followed by dribbling, but this condition may not develop until adult life is reached. Distention usually causes pain in the lower and lateral parts of the abdomen. Pain in the kidney on voiding suggests ureteral reflux. The later symptoms of uræmia are headache, irritability, languor, severe nausea, and vomiting. Death usually results after uræmic coma or an intercurrent infection.

Urethral valve obstruction is often diagnosed as chronic pyelitis, interstitial nephritis, and polycystic renal disease. The correct diagnosis is made by cysto-urethroscopy preceded by cystography with the use of 5 per cent sterile sodium iodide. If the residuum is over 3 oz., gradual decompression and continuous drainage should be carried out until functional stability has been established.

The treatment is removal of the obstruction. Young removes the valves with his punch. If the urethra is impassable, cystotomy by suprapubic approach may be done. The author has obtained excellent results by using the electrotome cutting current.

After the operation, fluids should be pushed. The prognosis depends on renal function and the damage that has been sustained.

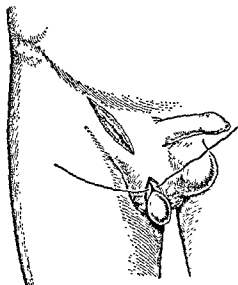
Campbell reports eighteen cases of posterior urethral valve obstruction in children.

BENJAMIN F. ROLLER, M.D.

GENITAL ORGANS

Schoemaker, J.: The Operative Treatment of Cryptorchidism (Traitement opératoire de la cryptorchidie). *Presse méd.*, Par., 1931, xxxix, 99.

During the past twelve years the author has used the technique of Hahn for the cure of cryptorchidism.



Closure of the tunica dartos with a suture to prevent retraction of the testicle.

The first stage consists of an incision as for inguinal herniorrhaphy, mobilization of the testicle, the digital formation of a path from the incision to the bottom of the scrotum, incision over the finger through all layers sufficient to allow the testicle to pass through, drawing of the testicle through this opening, closure of the incision with one suture to prevent retraction of the testes, and repair of the inguinal incision. The testicle is left outside the scrotum for twenty-four hours. In the second stage of the operation the single suture is cut, the testicle replaced within the scrotum, and the scrotal wound closed.

As this procedure caused considerable pain and was associated with the possibility of infection of the testicle, the author devised a modification of Hahn's procedure which obviates these features. His technique is as follows:

An incision is made as for hernial repair, the testicle is mobilized, and a path for the testicle is tunneled into the scrotum with the forefinger. An incision is then made over the finger down to the tunica dartos and, with the finger still in place, a bed is dissected for the testicle between the skin and dartos. Next, the finger is replaced with the handle of a bone scraper, the tunica dartos is picked up between two Kocher hæmostats, an incision sufficient to pass the testicle is made, the handle of the bone scraper is removed, and the testicle is drawn through the incision with forceps. The tunica dartos is then closed with one suture to prevent retraction of the testicle, the testicle is placed in the prepared bed, and the inguinal incision and the skin of the scrotum are closed.

In ten cases in which this method was used a perfect result was obtained.

JAMES B. MASON, M.D.

MacKenzie, D. W., and Ratner, M.: Tumors of the Testis; A Brief Series with Special Reference to the Pathology and Clinical Malignancy. *Surg., Gynec. & Obst.*, 1931, lii, 336.

The most common variety of testicular tumor is the teratoma. In 1696, Saint Donat found a testicular teratoma containing a rudimentary skull, and in 1803, Proschaska reported one which contained teeth, hair, and bone. In 1845, Curling stated that neoplasms of the testis regularly begin in the rete testis. In 1854, Johnson found elements of the ectoderm, endoderm, and mesoderm in a testicular tumor. In 1896, Wilms classified teratomata into 2 groups: (1) the adult, cystic, differentiated, mature, and non-malignant, and (2) the solid, undifferentiated, immature, and malignant. He maintained that all tumors of the testes are teratomatous and tridermal. Chevassu disagreed. In 1911, Ewing insisted that tumors of the testis always result from unilateral development of a teratoma, and not from spermatoblasts. In 1925, Bell demonstrated that a small group of malignant carcinomata of the testis are of extrateratogenous origin. Adami says that such tumors arise from an aberrant sex cell, this fact accounting for their frequency in the sex glands.

The greater number of testicular tumors are embryonal carcinomata in which 1 type of tissue predominates. The growths are soft, grow rapidly, and often show areas of necrosis, hæmorrhage, and suppurative. They are very malignant, metastasize early, and usually recur. They show round cells with vesicular nuclei. In this group is the adenocarcinoma.

A second group are teratoid or mixed tumors containing embryonal structures, which are very malignant.

Those of a third group resemble true chorion-epitheliomata, with a hæmorrhagic character of metastasis.

Those of a fourth group are rare and miscellaneous, including germoids, fibromata, chondromata, myomata, adenomata, and lymphosarcomata.

Malignant tumors of the testis are very malignant. They metastasize early. Metastases usually appear first in the lumbar glands or the glands along the spermatic vessels. The retroperitoneal glands are also involved very early. Later, the mediastinal and supraclavicular glands become involved.

Tumors of the testis are rare. They were found in only 50 of 300,000 patients admitted to the Mayo Clinic; in only 65 of 110,000 males admitted to the London Hospital, and in only 27 of 207,174 patients admitted to the Royal Victoria Hospital of Montreal.

Heredity plays no part in their development. They usually occur in the right testis and are rarely ever bilateral. Neoplastic disease of the undescended testis is also very rare. Trauma is said by some to be a cause. Tumors of the testis may occur at any age, but are most common between the ages of twenty and fifty years.

The symptoms include swelling of the scrotum, pain in the groin, hydrocele, shortness of breath, cough, and swelling of the legs. The condition must be differentiated from tuberculosis, syphilis, hydrocele, and haematocoele.

In operable cases of malignant disease of the testis the treatment is castration preceded by cutting of the cord to prevent metastasis and followed by X-ray or radium irradiation and the use of Coley's serum. In inoperable cases, deep X-ray and radium therapy are indicated. The mortality of radical operation ranges from 10 to 20 per cent. The prognosis of malignancy of the testis is grave because of the early metastasis. BENJAMIN F. ROLLER, M.D.

Monserrat, J. L., and Gálvez, I.: Malignant Tumor of the Testicle (Tumor maligno de testículo). *Rev. de especialidades, Asoc. med. argent.*, 1930, v, 1932.

The case reported by the authors was that of a man twenty-four years of age who had suffered a trauma of the testicle about a year and a half previously. The history of trauma suggested that the tumor of the testicle was a hematoma, but hematoma was ruled out by the evolution of the condition, the time since the injury, and the findings of palpation. Removal of the testicle was followed by metastasis. The patient was then given deep roentgen treatment, but left the hospital in a state of advanced cachexia.

The histological findings are described in detail. The neoplasm was made up of two kinds of tumor distinct in histological structure and pathogenesis. Part of it was a seminoma which had caused extensive hemorrhage, and the other part a wolffian epithelioma.

In the discussion of this report, ASTRALDI cited a case of sarcoma of the testicle with enlargement of the lumbo-aortic glands which disappeared spontaneously without irradiation. Astraldi regards irradiation as of no value in such cases.

SPURR said that in cases of tumor of the testicle he uses the surgical method of Chevassu, opening the abdomen and removing all of the affected glands, including the lumbo-aortic glands. He believes this gives the best chance of cure. He cited two cases. In one, there was survival for three months and in the other for four years. Spurr gave deep roentgen treatment in both, but believes it had little effect.

SALLERAS reported that he had operated on eight or ten tumors of the testicle. Two of the patients are living after four years. In the others metastases developed after varying periods of time.

SERANTES said that the time of recurrence depends more on the histological nature of the tumor than on the treatment. As much of the affected tissue as possible should be removed, but even extensive removal does not assure a permanent cure. Serantes cited a case in which gland recurrence was cured twice by roentgen therapy, the patient remaining free from the disease for a year in each instance, but death resulted from a third recurrence.

ASTRALDI stated that it is impossible to remove all of the affected glands.

SPURR said that he had obtained absolute cures of breast cancer by cleaning out the axilla and believes all glands tributary to a tumor region should be cleaned out. He does not have much confidence in roentgen therapy.

MONSERRAT said that it is impossible to establish a fixed treatment for tumor of the testicle as the procedure indicated depends not only on the histological nature of the tumor but also on the stage of its development. At present most surgeons operate on cases with lumbo-aortic metastases as it is impossible to be sure of removing all of the affected glands. Monserrat thinks operation should not be performed for seminoma as this form of tumor reacts well to radium therapy. AUDREY G. MORGAN, M.D.

MISCELLANEOUS

Bugbee, H. G., and Murphy, A. J.: The Value and Limitations of Uroselectan as an Aid in Urological Diagnosis. *J. Urol.*, 1931, xxv, 275.

The authors review twenty-six cases in which uroselectan was employed in urological diagnosis. By means of it they were able to demonstrate the absence of a kidney, poor renal function, and facts regarding the dynamics of the kidneys and ureters. However, they believe that, except in the very limited number of cases in which cystoscopic manipulation is impossible, it should be employed only as a supplement to other procedures.

JOHN P. O'NEIL, M.D.

Iselin, A.: The Prognostic Value of Azotæmia and Urea Constants Below Normal (Valeur pronostique des azotémies et constantes inférieures à la normale). *J. d'urolog. méd. et chir.*, 1930, xxx, 608.

The author reports two cases of prostatic disturbances in which a very low urea content in the blood and a low urea constant were increased to the normal or above normal by prolonged drainage of the bladder. When the blood urea and urea constant are high, they are decreased by drainage and drainage is said to improve them. The author therefore believes that a low content of urea in the blood and a low urea constant are as definite indications of renal changes as a high content of urea in the blood and a high urea constant.

WILLIAM W. WHITELOCK, Ph.D.

Katz, T.: Urogenital Tuberculosis in Man Produced by the Bacillus of Avian Tuberculosis (Tuberculose urogénitale chez l'homme produite par le bacille de la tuberculose aviaire). *J. d'urolog. méd. et chir.*, 1931, xxxi, 18.

The author discusses the characteristics of avian tuberculosis in animals and man and the use of avian tuberculin in the treatment of the condition.

Guinea-pigs are resistant to avian tuberculosis, but various other rodents and birds are susceptible to it. The infected liver and spleen are enlarged and sown with nodules the size of a pinhead. Especially

in birds, the serosa of the intestine is covered with nodules. The kidneys and joints are attacked, but the lungs and the bronchial lymph glands are not affected.

In contrast to cultures of human tubercle bacilli, the avian colonies appear several days earlier, present a peculiar mucofatty appearance, alkalinize glycerin broth, and show other cultural and morphological differences. The avian tuberculin reaction is specific. Rats, rabbits, and guinea-pigs have been inoculated by vein, peritoneum, muscle, and mouth. Rats and rabbits showed local and general effects of the disease such as nodules or septicæmia, but the guinea-pigs lived two or three years after the inoculation in perfect health.

The literature reports the occurrence in man of polycythæmia rubra with lesions of avian tuberculosis in the bone marrow, and of myelogenous leukæmia with lesions of avian tuberculosis in the spleen. The author reviews eight cases of avian tuberculosis in man—one with involvement of the genitalia, two with involvement of the skin, and five with involvement of the kidney. In one of the cases of renal infection the condition cleared up without treatment and the patient is still well today after six years. In two cases, a cure was obtained with tuberculin, and in two by nephrectomy.

The author has had two cases of avian tuberculosis. In one, there was a definite cystitis. The urine from the left ureter was cloudy and no indigo-carmin was excreted from the left kidney. Nephrectomy was done before cultures of the urine be-

came positive for avian tuberculosis. Histological examination of the kidney disclosed three cavities containing a creamy-yellow fluid, but no caseation and only a very slight fibrous reaction. After the operation the patient gained 8 lb. in three months. In the author's other case the left epididymis was involved and was removed after a few months of painful swelling. Six months later a fistula developed from the right epididymis. The exudate contained many polymorphonuclear cells and few lymphocytes. The patient's skin reacted to both avian and human tuberculin, and cultures of his blood were positive for avian tubercle bacilli.

It is not known whether the infection is ingested or inhaled. The bacilli of avian tuberculosis have been grown from well-cooked hen eggs. The mild pulmonary effects of the disease in man may be due to blood-stream infection of the lungs from an intestinal focus.

The course of the infection is septicopyæmic. It is associated with an afternoon temperature unaffected by antipyretics, night sweats, and variable cachexia. After this phase has persisted for months or years with remissions, the process usually localizes in a kidney, the bone marrow, or the skin.

The author describes the dilution of avian tuberculin for skin tests, the preparation of culture media for the avian tubercle bacillus, and the preparation of urinary sediment for inoculation. The diagnosis is based on negative inoculation results in guinea-pigs and positive inoculation results in rabbits and hens.

CURTIS NELSON, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Cohn, L. C.: Non-Suppurative Osteomyelitis.
Radiology, 1931, xvi, 187.

This article is based on a study of 105 cases of non-suppurative benign lesions of bone diagnosed as Paget's disease, ossifying periostitis, and non-suppurating osteomyelitis. Some of the lesions were due to trauma, some to syphilis, some to typhoid or influenza, and some to distant foci of infection. On the basis of their roentgen appearance they are classified as sclerosing, ossifying, destructive, or osteoporotic.

Seventy-five per cent of the patients were under forty years of age and 33 per cent were under twenty. In about 50 per cent of the cases the disease had been present for less than a year, but in 25 per cent it had been present about three years. A positive Wassermann reaction was obtained in 10 per cent of the cases. The fact that it occurred with equal frequency in the 4 types of lesions refutes the theory that syphilis is more likely to be associated with lesions of the destructive type.

The condition followed typhoid, influenza, or rheumatic fever in only 5 per cent of the cases.

In about 25 per cent of the cases more than 1 bone was involved. The tibia and femur were each involved in about 20 per cent of the cases and the pelvis, skull, and clavicle were each involved in about 5 per cent. The humerus was involved in about 8 per cent. In the remaining 35 per cent the lesions were in the radius, ulna, fibula, metatarsals, metacarpals, carpals, tarsals, phalanges, ribs, vertebrae, and jaws. The jaws and the tarsal and carpal bones were least frequently involved.

The roentgen appearance of the ossifying type of lesion varies from spur-like or mushroom-like exostoses to broad generalized ossification beneath the periosteum.

Confusion with sarcoma is most frequent in cases of lesions of the sclerosing type, especially those in which the sclerosis is combined with destruction of bone. Roentgenograms taken at different angles may be of aid in determining which process is most prominent.

The destructive type of non-suppurative osteomyelitis may show as much bone destruction as sarcoma.

The osteoporotic type of lesion suggests malignancy if syphilis and Paget's disease are ruled out.

When the diagnosis is doubtful it may be wise to try X-ray irradiation before radical surgery since in several of the cases reviewed in which the condition was thought to be malignant X-ray irradiation resulted in cure.

WILLIAM ARTHUR CLARK, M.D.

Brunschwig, A.: Epithelization of Bone Cavities and Calcification of Fibrous Marrow in Chronic Pyogenic Osteomyelitis. *Surg., Gynec. & Obst.*, 1931, liii, 759.

The author reports three cases of chronic pyogenic osteomyelitis of over fifty years' duration in which the bony cavities were partially lined with epithelium as the result of proliferation of the cutaneous epithelium along the sinuses. Sequestra with calcified marrow and calcification of marrow in living bone were also observed. Brunschwig concludes that epithelization of the cavity will cause the discharge to persist.

In two of the cases reported, amputation was soon followed by death, and in the third, operation failed to relieve the pain and discharge.

ELVEN J. BERKHEISER, M.D.

Hunter, D.: Hyperparathyroidism: Generalized Osteitis Fibrosa with Multiple Osteoclastomata. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 486.

The author reports a case in which generalized osteitis fibrosa occurred in association with hyperplasia of the right superior parathyroid and hyperparathyroidism. Removal of the parathyroid tumor resulted in a decrease of the serum calcium. Tetany was relieved by a high calcium diet, intramuscular and intravenous injections of calcium preparations and the administration of parathyroid extract and irradiated ergosterol. After this treatment the bony tumors decreased in size, the weight increased and muscular development improved.

WALTER P. BLOUNT, M.D.

Ferbert, H.: Osteitis Fibrosa Localisata in Adults (Ostitis fibrosa localisata bei Erwachsenen). *Ztschr. f. orthop. Chir.*, 1930, liii, 285.

In the author's four cases and all of the cases of osteitis fibrosa localisata in adults which have been reported to date the tibia was involved. Even in the generalized type of osteitis fibrosa the tibia is first and most commonly affected. After an interval the process then appears in the other tibia or other bones. In order to prove that the condition is localized a considerable period of observation is necessary. Of the author's cases, a period of thirty years elapsed in one, a period of fifteen years in two, and a period of only seven years in one.

The localized forms tend to disprove the theory that endocrine disturbances are a cause. Neither is arteriosclerosis a factor. Lues could be ruled out in the cases reviewed. The great discrepancy between the incidence of the condition and a history of trauma ruled out trauma as an etiological factor. However, the predisposing effect of trauma cannot be denied although its mode of action is not clear.

Apparently small hæmorrhages or injuries to the nutrient vessels of the bone are etiological factors. The latter would fit in with the theory that osteitis fibrosa is a chronic nutritional disturbance of bone caused by embolism.

Schmieden's warning against operation is not always applicable. Operation may decrease or correct deformities and cosmetically transform the thickened bone. Deforming joint changes occur rarely. The prognosis is relatively favorable. The process may run its course for years or decades without causing appreciable functional disturbances. The author refutes the reports in the literature which emphasize the rarity of spontaneous fractures as he has observed a number of fractures in his material.

DRUEGG (Z).

Copeland, M. M.: Bone Metastases: A Study of 334 Cases. *Radiology*, 1931, xvi, 198.

In 100 of the 334 cases of bone metastases reviewed the primary tumor was in the breast. The bones involved were the spine, pelvis, femur, skull, ribs, and humerus. In 58 per cent of the cases the carcinoma was of the scirrhous type. Pain of a severe rheumatic character was an important symptom which in most cases developed from three to eighteen months before evidence of the bone lesion was shown by roentgenograms. Pathological fracture resulted in 15 cases. In 13, it occurred in the femur. In 75 per cent of the cases of metastasis from breast cancer there were multiple metastases. There was evidence to show that the metastases occurred by both the blood stream and the lymph channels. In 74 of the cases a radical amputation of the breast had been done, and in 18 a simple amputation or local excision. In 8, no surgical treatment had been given. In most of the cases high-voltage roentgen irradiation relieved the pain, and in some of them it prolonged life.

In 22 cases the metastases were due to a hypernephroma. The bones involved were the humerus, spine, femur, pelvis, ribs, bones of the feet, skull, and sternum.

Prostatic cancer was the source of the metastases in 134 cases. The bones in which the metastases appeared were the pelvis, vertebrae, femur, tibia, and skull. The roentgenograms showed that all of the metastatic lesions in the bones were predominantly osteoplastic. This was evident also in the gross specimens, which showed areas of bone formation around the grayish nodules of cancer tissue. Roentgen therapy relieved the pain, but did not cure.

There were only 2 cases of bone metastases from malignancy of the testicle, 2 cases of metastases due to malignancy of the ovary, and 1 case of metastases due to carcinoma of the bladder.

In 5 cases the primary tumor was a carcinoma of the uterus. The bones involved were chiefly those of the pelvis. The patients ranged from thirty-five to sixty years of age.

Thyroid malignancy has a tendency to metastasize near the epiphyses of long bones, but the primary

tumor was found in the thyroid in only 6 of the cases reviewed.

Seven patients out of 537 with primary gastric cancer had bone metastases. Their ages ranged from thirty-nine to seventy-one years. The bones involved were the ribs, pelvis and femur, vertebrae, sternum, skull, and scapula. The roentgenogram showed diffuse mottling without distortion of the bone shell.

In 4 of the cases reviewed the bone metastases were due to pulmonary malignancy. The roentgen findings in such cases may suggest endothelioma of bone.

The incidence of bone metastases from the various primary sources is summarized as follows: hypernephroma, 34.9 per cent; lung, 16.6 per cent; prostate, 12.8 per cent; testicle, 7.7 per cent; ovary (sarcoma), 6.6 per cent; uterus, 5.6 per cent; breast, 5.2 per cent; thyroid, 4 per cent; and stomach, 1.3 per cent.

WILLIAM ARTHUR CLARK, M.D.

Geschickter, C. F.: The Roentgenological Diagnosis of Bone Tumors. *Radiology*, 1931, xvi, 111.

This article is based on an extensive study of bone lesions of neoplastic origin and certain dystrophies and inflammatory and nutritional diseases from which bone tumors must sometimes be differentiated.

The various tumors are grouped according to whether or not they produce single or multiple involvement of the skeleton, whether they are more common before or after the twentieth year of age, and whether they are primarily osteolytic or osteoplastic. The relative frequency of the different lesions in the different bones and the parts of each bone is shown by skeletal diagrams, and the age incidence of the various types is shown by curves. The clinical and roentgen characteristics of individual lesions are described and their histogenesis is reviewed to aid in the analysis of the roentgenogram.

The entities discussed are metastatic carcinoma, periosteal osteogenic sarcoma, osteochondroma, (exostosis), giant-cell tumor, bone cysts, osteolytic osteogenic sarcoma, Garré's sclerosing osteomyelitis (inclusive of ossifying periostitis), myxosarcoma, chondromyxoma, Ewing's sarcoma, periosteal fibrosarcoma, latent bone cysts, myositis ossificans, multiple bone cysts and osteomalacia, Paget's osteitis deformans, multiple myeloma, Brodie's abscess, fragile bones, osteomyelitis, tuberculosis, and syphilis.

ADOLPH HARTUNG, M.D.

Anderson, H. S.: Lesions of the Clavicle. *Radiology*, 1931, xvi, 181.

In a search through the files of the surgical pathological laboratory of the Johns Hopkins Hospital, Baltimore, records of 46 lesions of the clavicle were found among those of 1,700 bone lesions. The clavicular lesions included a metastatic carcinoma in 16 cases, multiple myeloma in 8 cases, periostitis in 7 cases, a bone cyst in 4 cases, a Ewing tumor in 4 cases, an exostosis in 2 cases, and a chondroma,

giant-cell tumor, chondroblastoma, osteogenetic sarcoma, and sclerosing sarcoma in 1 case each.

In 8 of the 16 cases of metastatic carcinoma the primary lesion was undetermined. In 4 cases, the metastasis had its origin in a carcinoma of the breast; in 1 case, in a malignant pigmented mole; in 2 cases, in a sarcoma of the soft parts; and in 1 case, in an adenoid cystic carcinoma. An observation of interest was that none of the bone metastases in 110 cases of prostatic tumors and 22 cases of hypernephroma occurred in the clavicle.

In 5 of the 7 cases of periostitis there was a history of syphilis, and in 3 of these 5 the condition was cured by anti-syphilis treatment.

The ages of the patients with bone cysts were seven, seventeen, forty-nine, and seventy-two years. The patient who was seventy-two years old had had swelling and pain in the outer end of the clavicle for about fifty years. In the other patients the lesion occurred in the sternal end of the clavicle where the epiphysis does not unite until about the twenty-fifth year of age.

In both of the cases of Ewing's round-cell sarcoma resection of the clavicle was done. The patients were well seven and nine years respectively after the operation.

In 1 of the 2 cases of exostosis other bones besides the clavicle were involved and the patient gave a history of syphilis. In the other case, that of a boy eleven years of age, the condition was probably of traumatic origin and was cured by resection.

In the case of giant-cell tumor, resection of the clavicle and first rib was done fourteen years ago. No malignancy was found, and the patient is well at the present time.

The patient with the chondroblastoma died about ten months after the appearance of the first symptoms.

WILLIAM ARTHUR CLARK, M.D.

Major, R. C.: Lesions of the Upper Humerus. *Radiology*, 1931, xvi, 224.

The upper part of the humerus is the occasional site of all common bone tumors and the common site of exostoses, bone cysts, chondrosarcoma, and metastatic carcinomata. Chondrosarcomata constitute about 20 per cent of the malignant lesions of the upper humerus.

An exostosis is readily identified in the roentgenogram from its base or pedicle of normal bone projecting through a gap in the periosteum and surmounted by a cartilaginous cap. Exostoses usually occur between the ages of ten and twenty-five years and are found most frequently in the ends of long bones at the site of a tendon attachment.

Multiple exostoses occurring as a manifestation of hereditary congenital bone disease should not be excised until the growth period is ended. Both single and multiple exostoses may give rise to chondrosarcoma.

Chondroma or chondromyxoma, a benign tumor, is rare in the long bones. It is most common between the ages of twenty and thirty years.

Chondrosarcoma may occur as a primary tumor or may be secondary to a benign exostosis or chondroma. The primary type appears most frequently between the ages of fourteen and twenty-one years, and the secondary type after the age of thirty-five years. The onset of malignancy in secondary chondrosarcoma is characterized by a rapid increase in the size of the neoplasm and pain. In the roentgenogram there is a more or less translucent subcortical shadow with a fuzzy infiltrating outer margin. Ultimately the tumor involves the cortex of the bone. The clinical course of the primary form usually ends within twenty months, while that of the secondary form extends over a longer period.

The sclerosing type of osteogenic sarcoma is characterized in the roentgenogram by dense radiating periosteal bone of the sun-ray type. Trauma usually precedes and pain accompanies the formation of the tumor. The average duration of the symptoms is ten months.

Ossifying periostitis and myositis ossificans are found in the humerus only rarely.

Bone cysts, of which the upper humerus is the second most frequent site, occur in the metaphysis and cause smooth, symmetrical expansion and thinning of the cortex, usually without rupture. As a rule they occur before the eighteenth year of age. Symptoms are almost entirely absent until pathological fracture occurs.

Giant-cell tumors and the chondroblastic sarcoma, a highly malignant tumor, are rare in the humerus.

The osteolytic osteogenic sarcoma occurs most frequently in young adults. The roentgenogram shows central bone destruction involving the cortex, but not causing cortical expansion, and a definite periosteal reaction which, however, does not parallel the sun-ray effect produced by the sclerosing type of osteogenic sarcoma.

Multiple myelomata usually occur in the sixth decade of life. The roentgenogram shows central "punched-out" areas and pathological fractures.

Metastatic tumors are rather common in the upper humerus. Hypernephroma is the chief primary tumor. Diffuse osteolytic metastases from carcinoma of the breast are not rare in the upper part of the humerus and the shoulder girdle.

The benign cyst and the malignant metastatic tumor do not require surgical intervention. In cases of other tumors in which the nature of the neoplasm is doubtful, it is best to put the arm at rest, administer roentgen therapy, and obtain competent consultation on the roentgenograms. In all malignant lesions of the upper part of the humerus resection offers as much as amputation.

ROBERT C. LONGERGAN, M.D.

Codman, E. A.: Epiphyseal Chondromatous Giant-Cell Tumor of the Upper End of the Humerus. *Surg., Gynec. & Obst.*, 1931, lxi, 543.

A study of nine giant-cell tumors of the upper end of the humerus which were recorded in the Registry

of Bone Sarcoma and had been variously designated as giant-cell tumor, chondroma, and chondrosarcoma led the author to the conclusion that all of them were benign tumors of a chondromatous type. Because of the uniformity in the roentgenograms and sections, the long duration of the condition prior to the operation, the patients' ages (twelve to twenty-four years), and the good results from conservative treatment, this group of tumors may be considered a clinical entity.

The tumors occur in the greater tuberosity, but are checked at the epiphyseal line of the head so that they do not extend to the joint cartilage as in other locations. Instead of the characteristic trabeculae shown by giant-cell tumors in other bones, they present a fluffy "cotton-wool" appearance.

Microscopically, they are characterized by the presence of peculiar epithelioid cells which merge into a low-grade type of cartilage cell and into the tumor cells. The cartilage-like tissue is probably derived from the epiphyseal line.

The author believes that, in the treatment, irradiation is preferable to operation.

WALTER P. BLOUNT, M.D.

Oliver, R. L.: Bone Lesions of the Lower Radius. *Radiology*, 1931, xvi, 245.

Of over 2,000 bone lesions, only 56 were in the radius, and of the latter, 90 per cent were in the lower end of that bone.

In 3 of the cases the lesion in the lower end of the radius was due to a non-suppurating osteomyelitis and 2 or more bones were involved. The incidence of cure in non-suppurating osteomyelitis is about 90 per cent. As a rule, cure is obtained by operation.

Exostoses are comparatively infrequent in the radius. Of the cases reviewed, they were found in the radius in 7 and in the lower end of the radius in 4. The roentgenogram showed the exostoses to have pedicles. The author believes that if the case is kept under observation and occasional roentgenograms are made no treatment is necessary unless there is an undue increase in the size of the tumor and its symptoms. Multiple exostoses usually involve the fibula or the radius.

Only 1 chondroma was found in the radius. This was cured by simple excision.

Bone cysts occurred in the radius in 4 cases, and in 3 of these in the lower end of the bone. The roentgenogram reveals a central lesion in the shaft with a marked decrease in density, a symmetrical contour, and a smooth, well-defined outline. When a pathological fracture occurs there is a tendency toward ossification. All of the cases reviewed showed central expansion of the bone. The treatment of bone cysts is removal of the connective tissue lining and obliteration of the cavity with bone chips.

Giant-cell tumors make up the greater number of lesions in the lower end of the radius. They usually occur after the age of twenty years. They cause central expansion of the cortical bone and have an

asymmetrical contour. Frequently they perforate the capsule. After perforation of the capsule the chances of cure are diminished because of the difficulty of removing the tumor completely.

The microscopic picture varies. In some cases it resembles that of a bone cyst except that giant cells are usually more numerous and the stroma is made up of small round cells rather than the spindle cells which sometimes predominate in the picture of bone cysts. Of a total of 226 giant-cell tumors, only 35 were in the lower part of the radius. In 9 of the 35 cases curettage was followed by recurrence. Thirty of the patients were eventually cured.

Osteogenic osteolytic sarcoma was found in the lower end of the radius in 1 case. The roentgenogram in this condition shows a mottled central area of bone destruction with or without bone expansion. This tumor is a form of osteogenetic sarcoma with giant cells—a destructive type. In the case cited, death occurred after amputation preceded by X-ray treatment.

Chondromyxosarcoma and sclerosing sarcoma of the radius were found in 1 case each.

In the diagnosis it is necessary to differentiate first between central and periosteal lesions. In the cases reviewed the periosteal lesions were exostosis and sclerosing sarcoma. Sometimes non-suppurating osteomyelitis occurs as a periosteal lesion. Osteomyelitis is characterized by both osteoporosis and osteogenesis without the radiating bone seen in sarcoma. Chondromata, bone cysts, and giant-cell tumors cause central areas of rarefaction. The differentiation between bone cysts and giant-cell tumors may be made on the basis of the contour and position of the lesion and the patient's age. The sarcomata may be differentiated by their irregular outlines.

ROBERT C. LONERGAN, M.D.

Hagen-Torn, J.: Solution of the Problem of the Development of the Asymmetry of the Skull and the Scoliosis in Cases of Caput Obstipum. Correction of These Conditions by My Operation (Die Lösung des Problems ueber die Entstehung der Schaedelasymermetrie und Skoliosis bei Caput obstipum. Die Beseitigung derselben durch die Operation nach meiner Methode). *Arch. f. Klin. Chir.*, 1930, cxliii, 35.

Since Stromeyer in 1838 opposed, with his own theory, the previously current conception of muscular wry neck as a congenital affection, which was originated by physicians of Holland in the seventeenth century, the controversy on this subject has never entirely subsided. Stromeyer taught that the condition is the result of an intrapartum injury to the sternocleidomastoid muscle. The author accepts the Stromeyer theory. He first presented his views on the subject and described his operation for the correction of the condition before the Obstetrical and Gynecological Society of Leningrad twelve years ago, but as his speech was published only in the Russian Journal of Gynecology it did not receive wide notice. He now reports twenty cases in which

a good result was obtained by his operation without the aid of any form of postoperative orthopedic treatment. The method consists essentially of lengthening of the affected muscle by a procedure similar to a tenotomy on the Achilles tendon. The technique is as follows:

A longitudinal incision as long as the difference in length between the two sternocleidomastoid muscles is made in the shorter muscle. Then, from the upper end of this incision, a transverse incision is made to the medial border of the muscle, and from the lower end of the longitudinal incision another transverse incision is made to the lateral border of the muscle. After the muscle flaps thus formed have been freed from adhesions, particularly from adhesions to the large vessels, under the guidance of direct vision, they are carefully united end-to-end by suture. The head is well braced by means of a dressing of cotton wadding. After removal of the stitches, electrical treatments and massage are begun.

Even as early as a year after the operation the author has observed as good function in the muscle operated upon as in the other muscle. He reports the cases of two patients whom he recently presented before the Surgical Society. The first case, that of a girl, will be briefly reported here because the patient has been under the author's observation for a long time.

At birth, the patient presented by the pelvis and was delivered by manual means after thirty-six hours of labor. When the author was called in attendance on the third day after her birth, he discovered a hæmatoma above the left clavicle and in the right rectus femoris muscle. Apparently the left sternocleidomastoid muscle had been lacerated by the heavy pulling during the manipulations at the time of birth. By the end of the first year, wry neck had developed. The author recommended operation, but after consulting with other surgeons, the parents would not permit it. They consented to surgical treatment only when the child had reached the age of two and a half years. The difference in length between the two sternocleidomastoid muscles was 3 cm., and the difference in distance between the lateral canthus and the angle of the mouth on the two sides was $\frac{1}{2}$ cm. The operation was performed as described. Today, thirteen years later, the asymmetry of the face and the scoliosis of the spine have entirely disappeared.

In an attempt to explain this remarkable regression of the sequelæ of wry neck the author found the theory of Dieffenbach insufficient. Dieffenbach compared the pull of the shortened muscle to the pull on the string of a night-cap. He said: "If one pulls on the band of one of the cheek-flaps, the cap follows the direction of the pull and the opposite side slides up." In the author's opinion, two forces are at work—the pull of the shortened muscle and the normal tissue-tension of the growing bony structures. The pull of the muscle opposes the tissue-tension, thereby causing unequal growth of the cervical vertebrae and the bones of the skull.

To understand the peculiar asymmetry and scoliosis of the vertebrae and skull the components of the forces at work and the effects in different planes must be analyzed. In the frontal plane, the direction of the pull impedes growth in length. In the horizontal plane, the pull acts tangentially to the horizontal section of the vertebra, exerting a twisting effect. However, as the vertebral column is made up of separate sections elastically bound together, the torsion varies in the different sections in accordance with Coulomb's law. The limitation of growth occurs similarly. In the sagittal plane there is a twisting displacement of the vertebral column about the vertical axis, which can be easily detected by observing the alignment of the vertebral spines. This twisted maldevelopment of the vertebrae and of all the cavities of the skull begins only when the torsion has advanced so far that the insertion of the shortened muscle is directly above its origin at which stage the component acting in the horizontal plane equals zero.

If the tissue-tension of the growing bone is restored by operation, complete restitution to normal is possible as the potential energy is enabled to assume the kinetic form. Good results can be obtained only by surgical treatment. MANDEL (Z).

Meyer, H.: Spondylolisthesis and Accident (Spondylolisthesis und Unfall). *Arch. f. orthop. Chir.*, 1930, xxix, 109.

In spondylolisthesis it is necessary to differentiate strictly between the actual process of dislocation and the preliminary stage, the loosening in the interarticular portion. The preliminary stage, which Neubauer believes to be a congenital malformation, a defect of ossification, is always an acquired process. The conditions for its development are: (1) a peculiarity in the stratification of the transverse articulations in relation to each other, (2) increased weight on the transverse articulations (lordosis), and (3) extensive movement in the lumbar region. While it must be admitted that the preliminary stage may be induced by trauma causing unilateral or bilateral fractures at symmetrical sites in the arch region, this is very rare and occurs only when the trauma is severe. Aggravation of a pre-existing spondylolisthesis by an injury is far more probable and is to be assumed in most cases with a history of trauma. As a rule, however, the aggravation of the process is only temporary and by the end of thirteen weeks the effects have cleared up. If one is to assume their continuance beyond this time, roentgenological evidence of increased sliding since the injury is necessary.

According to the view here stated regarding the origin of the sliding process and its preliminary stage, there is still a third relationship between injury and spondylolisthesis, namely, the occurrence of the condition after fractures of the vertebrae in the lower thoracic and upper lumbar segments which result in increased thoracic kyphosis and lumbar lordosis. In these segments there some-

times develops in the course of years, as the result of excessive weight-bearing and shearing forces, a zone of transformation. The peculiarities of this process in a case studied are described in detail. Such a zone of transformation may appear also as the result of too great weight-bearing in cases with uncompensated shortening of a lower extremity, flexion contractures of the hip, fractures of the pelvis, and deforming arthritis in the lower lumbar segment.

INGEL (Z).

Puhl, H.: Infectious Spondylitis (Ueber Spondylitis infectiosa) *Deutsch. Ztschr. f. Chir.*, 1930, cxxviii, 172

By the term "infectious spondylitis" is implied a pyogenic inflammatory disease of the bodies of the vertebrae (the vertebral arches and processes are rarely involved) which does not lead to suppuration, but in healing with the formation of defects or with replacement of bone. An acute infection precedes it for a variable period of time. Of the six cases reported by the author, it may be assumed that grippé occurred in four and typhoid fever in one. In one, the paratyphoid bacillus was found.

Even when there are general symptoms with an increase in the sedimentation rate of the red blood cells and in the leucocytes, changes of the vertebral bodies can be demonstrated in the roentgenogram only after a certain length of time. Circumscribed foci of destruction appear among the cranial or caudal epiphyseal plates of bone, which foci obscure the sharp lines of demarcation. At the same time the affected intervertebral cleft becomes constantly more narrow and there is a change in the outline of the vertebral column in the form of a kyphosis or scoliosis. Later, just as in osteomyelitis and in contrast to tuberculosis, periosteal deposits form on the vertebral bodies, but only in the vicinity of the intervertebral disks. Ultimately, in the course of regression, these deposits become bridging spans and indicate the stage of healing. Such spans may appear also at sites distant from the disease focus. Under such circumstances they are to be attributed to the influence of the changed statics of the vertebral column. Under certain conditions the picture may simulate that of a healed compression fracture. Foci of calcification in the intervertebral disks can rarely be demonstrated. The prognosis is good if supporting therapy (the use of a plaster bed or supporting corset) is carried out for a sufficient length of time. The postural anomaly persists.

MAX BUDE (Z).

Docimo, L.: Changes in the Cerebrospinal Fluid in Pott's Disease (Le modificazioni del liquido cefalorachidiano nel morbo di Pott). *Poliglino*, Rome, 1931, xxxviii, sez. chir. 8

Changes in the color and dissociation of the cellular elements and the albumin content (scarcity or absence of cells with an increase in the albumin) constitute the syndrome of Sicard and Foix. It is generally agreed that, under normal conditions, the

albumin contained in the cerebrospinal fluid varies between 0.15 and 0.20 gm. per 1,000 c.cm., and that usually there is a relationship between the number of cells and the amount of albumin.

To obtain a clearer interpretation of the humoral syndrome in Pott's disease, the author examined the spinal fluid of eleven patients with that condition. Ten cubic centimeters of the spinal fluid were withdrawn by puncture, and whenever possible the punctures were made both below and above the lesion. In no instance was a marked difference found in the fluid from the two sources. The author reports the eleven cases in detail and describes the technique employed in the examination. A marked change in the spinal fluid was found in only one case, and a slight increase in the albumin in five cases.

The mechanism of the cord compression in such cases has long been the subject of controversy. It seems clear, however, that in the great majority of cases the compression is caused by the ossifluent abscess which finally forms in the spinal canal and produces extradural compression with its sequelae. The effects of the compression may disappear at any moment if the abscess is able to discharge externally.

Nervous disturbances in the author's cases never assumed the gravity of a paraplegia of Pott's disease. In two cases they consisted only of sensory motor disturbances of the lower limbs. In one case they assumed a parietic aspect, with slight accentuation of the reflexes. In the first two of these three cases the cerebrospinal fluid was normal except for a slightly positive Pandy reaction. In the third, xanthochromia and a distinct dissociation of the cellular elements and albumin content of the cerebrospinal fluid were found.

The author believes that the circulatory disturbance is a determining factor in the humoral syndrome. He assumes that the peridural edema causes compression of the spinal foramina, and that this compression, before producing a reaction of the nerve roots, obstructs the blood vessels, thereby causing disturbances of the cord circulation which are most marked in the immediate area. From the blood vessels of the involved segment and the contiguous blood vessels the elements constituting the syndrome take their origin.

The xanthochromia, instead of being the result of a true hemorrhage, may be due to transudation of the plasma into the cerebrospinal fluid through the walls of the meningeal vessels as the result of an increase in the intravascular pressure causing slight and repeated punctiform hemorrhages, or it may be due to diapedesis of the red cells. In any event, xanthochromic coloration is always of hematogenous origin. The increase in the albumin may be attributed to the same mechanism of transudation.

With regard to the positive Pandy, Nonne-Apert, tryptophane, and Takata-Ara reactions in some of the cases, the author states that while on first consideration these may suggest a change in the cerebrospinal fluid of meningeal origin, it has been shown that they may be due to a simple meningeal irrita-

tion and may be present in cases of medullary tumors. Sicard has demonstrated that the globulin reaction is of greater value when it is negative than when it is positive. WILLIAM W. WITTELOCK, Ph.D.

Doub, H. P., and Badgley, C. E.: Tuberculosis of the Intervertebral Articulations. *Am. J. Roentgenol.*, 1931, xxv, 299.

Tuberculosis of the spine is a local manifestation of a disease having its primary focus elsewhere. The infection is usually transmitted by the hæmatogenous route and possibly localizes at a point where there has been a preliminary change in a nutrient artery, a tuberculous endarteritis obliterans. The interior of the body of a vertebra is supplied by a branch of the posterior spinal artery, while the anterior portion of the body, the neural arch and the transverse processes are supplied by the intercostal arteries. The various typical types of vertebral tuberculosis are explained on the basis of the blood supply.

The central type is seen particularly in children and may cause few symptoms until the necrosis of the vertebral body results in collapse and kyphosis. The intervertebral disk is involved secondarily. The epiphyseal type of involvement results in early narrowing and disappearance of the intervertebral disk with coaptation of the vertebrae. Abscess is frequently one of the first clinical findings. Kyphosis is unusual. In the anterior type, the infection appears in the anterior portion of the vertebral body and frequently spreads beneath the anterior longitudinal ligament. It may also invade the body of the vertebra and become identical with the central form. In rare cases, the vertebral appendages are involved.

The authors discuss particularly the epiphyseal type of the condition which they prefer to call "intervertebral articular tuberculosis" instead of "epiphyseal tuberculosis of the vertebral body." When the infection of the spine originates in the articular margin, the normally poor circulation of the disk is soon destroyed and there is early disappearance of the disk with resulting coaptation of the bodies. This process is often associated with a small erosion or roughening of the articular margin, but the normal size and shape of the vertebral body is preserved and there is no kyphosis. The bone changes constitute early evidence of this form of spinal tuberculosis and are frequently accompanied by roentgen evidence of abscess formation. Treatment should be instituted before bone deformity occurs.

The authors report three cases in which the diagnosis was based largely on the finding of a narrowed intervertebral disk with erosions on the articular surface.

CHESTER C. GUY, M.D.

Thompson, G. T.: Lesions of the Upper Femur. *Radiology*, 1931, xvi, 278.

Lesions of the upper part of the femur are frequently overlooked, the symptoms being ascribed

to sciatica or rheumatism and no roentgenograms being taken. The upper part of the femur is a common site of tumor metastases and bone cysts. Because of the inaccessibility of the region, beginning tumors may be revealed only by the roentgenogram. About one-half of the malignant tumors in the upper part of the femur are metastatic growths. In 35 cases of primary malignancy of the upper part of the femur which are reviewed by the author there were no five-year cures. Among 146 tumors of the upper part of the femur which are recorded in the Laboratory of Surgical Pathology of the Johns Hopkins Hospital, Baltimore, the most common were bone cysts, which numbered 45. On account of the proximity of the 3 separate epiphyses in this region, the differentiation between giant-cell tumor and bone cyst is difficult. It should be remembered that giant-cell tumors occur usually after the age of twenty-five years and bone cysts before the age of eighteen years.

CHESTER C. GUY, M.D.

MacAusland, W. R.: Derangements of the Semilunar Cartilages. *Ann. Surg.*, 1931, xciii, 649.

This report on derangements of the semilunar cartilages is based on a study of 388 surgically treated cases. The author discusses the anatomy, etiology, surgical pathology, symptoms, diagnosis, prognosis, and treatment.

In the majority of cases, removal of the semilunar cartilage is followed by a satisfactory result. The best results are obtained when the patient is a young adult and the cartilage is removed shortly after the trauma. In the cases of older patients, especially those with arthritic changes, a guarded prognosis must be given if the cartilage injury is old.

ELVEN J. BERKMEISER, M.D.

Diamant-Berger, L., and Sicard, A.: Traumatic Lipo-Arthritis of the Knee (*La lipo-arthrite traumatique du genou*). *Rev. d'orthop.*, 1931, xxxviii, 5.

The adipose tissue of the knee consists of: (1) a fatty infrapatellar mass prolonged behind by the adipose ligament, and (2) synovial fringes. Traumatic lipo-arthritis of the knee is explained by post-traumatic hyperæmia. The infrasyovial fatty tissue proliferates in the form of arborizations pushing into the synovial cavity and forming the villousities which are characteristic of the condition. These may be localized in the infrapatellar fat (Hoffa's disease) or in a synovial fringe (solitary lipoma), or form a generalized arborescent lipoma.

Hoffa's disease is always of traumatic origin and may be a sequela of any traumatic arthritis of the knee. After the traumatism the patient suddenly feels violent pains which decrease with rest, but on movement recur and gradually increase. There is spontaneous pain, but the most severe pain occurs at the moment of complete extension of the leg. Examination must be made with great care. At first there is a peripatellar swelling with effacement of the parapatellar planes. Below and on each side

of the patella there is a mass, often larger than the thumb, which gives the impression of fluctuation transmissible behind the patellar ligament and is generally sensitive to pressure. Sometimes the signs are unilateral. Hydrarthrosis is not frequent. Active movements of the joints are not greatly disturbed except perhaps in extreme extension. Passive movements are usually free, but become painful when extension or flexion is forced. Passive movements may cause crackling sounds. Atrophy of the quadriceps is rapid and manifest. Lateral roentgenograms are sometimes of diagnostic aid.

The author explains the solitary lipoma by assuming that under the influence of the traumatism a fatty fringe hypertrophied and acquired a pedicle. Histological examination discloses inflammation with intense proliferation of the fibrous tissue. The symptoms are those of a chronic post-traumatic arthritis with a localized painful zone. In a sudden movement the fatty intra-articular mass may become twisted around its pedicle.

The arborescent lipoma has been believed to be of spontaneous origin. Tuberculosis has been found in some cases, but is not constant. The rôle of traumatism seems undeniable. The symptoms are those of chronic, intractable, and recurrent hydrarthrosis.

The only radical treatment of Hoffa's disease is total extirpation of the infrapatellar adipofibrous tissue. The results of this procedure are excellent. Surgery is advisable also in the localized form of lipo-arthritis with a synovial fringe. In the generalized form, medical treatment often results in improvement, but when it fails and the functional disturbances are marked, synovectomy is the logical operation.

These three affections seem to be three clinical forms of the same disease.

The adiposynovial tissue of the knee reacts to chronic disturbances as to traumatism.

The authors report three cases of traumatic lipo-arthritis of the knee. The first was a case of Hoffa's disease in which there were two distinct lesions, a benign prepatellar hygroma which was present before the traumatism and a hyperplasia of the infrapatellar fatty mass which was related to the traumatism and caused pain. The second was a case of volvulus of a pedicled intra-articular lipoma of the knee, and the third a case of arborescent lipoma which developed in the course of post-traumatic chronic arthritis and was treated by synovectomy.

PAGE.

Moore, J. R.: Tumors of the Os Calcis. *Radiology*, 1931, xvi, 232.

In a review of the literature for the past fifty-one years the author found the reports of 92 tumors of the os calcis. The neoplasms included 67 benign exostoses, 1 chondroma, 4 bone cysts, 4 giant-cell tumors, 2 chondrosarcomata, 4 Ewing endothelial myelomata, 8 unclassified sarcomata, and 2 epitheliomata.

The author calls attention to the similarity of the os calcis to the long bones in structure, formation, and development. He states that to some extent the behavior and types of tumors involving the os calcis are similar to those of tumors found in the long bones. Among 1,740 bone tumors he found 32 neoplasms of the os calcis.

In 23 of the author's cases the tumor of the os calcis was an exostosis. Its discovery was preceded by pain for from six months to a year. One spur was located near the attachment of the tendon of Achilles whereas the others were on or between the plantar tubercles. All were treated by excision. Three recurred.

In cases of chondroma of the os calcis the neoplasm should be frequently examined with the roentgen ray and the possibility of malignant change should be constantly borne in mind. If malignant changes become evident, early amputation offers the only hope.

Giant-cell tumors treated by curettage before perforation of the shell have little tendency to recur. When soft-part invasion is extensive, excision or amputation may be necessary.

Ewing's tumor offers little hope of life.

ROBERT C. LONGERAN, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bunnell, S.: Physiological Reconstruction of a Thumb After Total Loss. *Surg., Gynec. & Obst.*, 1931, lxi, 245.

In the function of the hand, motion and sensation are of equal importance. This is true especially in the thumb.

If a thumb is reconstructed by transplanting to the hand a digit from the other hand or a foot or a skin graft with a tubular pedicle taken from the abdomen and stiffened by a bone graft, trophic atrophy will follow because of the annular scar. In some cases the reconstructed thumb will acquire a slight degree of sensation, but it will not be sufficient for stereognosis. A finger with the volar nerves cut is permanently anesthetic. Unless the natural nerve supply is grafted with a digit or the two volar nerves of the new digit are sutured to those at the base of the lost digit, the proper degree of sensation and trophic influence will not be acquired. When the reconstructed digit is made from abdominal skin it will lack the specialized touch corpuscles which are present in the finger and can never acquire stereognosis greater than that present in the abdominal skin.

In the reconstruction of the thumb other requisites to be sought besides stereognosis are strength, durability, movability, and the functioning position of opposition.

The author reports a case in which the normal nerve and vascular supply were preserved and all of the muscles and tendons of the old thumb were attached in their former arrangement to the new thumb.

The patient was a man forty-nine years of age whose thumb had been amputated through the carpometacarpal joint and whose index finger had been amputated through its proximal phalanx by a circular saw. At operation, the metacarpal and remaining base of the phalanx of the index finger were disarticulated and transplanted to the position of the thumb and the flexor and extensor muscles of both the index finger and the thumb were transplanted through drill holes to their respective positions.

In the transplantation, the volar digital nerve to the second interdigital cleft was slit longitudinally up to the base of the palm so that sensation would be preserved on both the radial side of the long finger and the ulnar side of the index finger. The fork of the volar artery to this cleft was cut and ligated on the long finger side to give a richer blood supply to the new thumb. All of the small thenar muscles were dissected out and attached to the metacarpal of the new thumb.

As a result of this procedure, a very strong and movable thumb with natural sensation and vascularity was obtained and the patient was able to resume his trade of carpentry.

The author reviews briefly the methods that have been used by others for reconstruction of the thumb, including those of Huguier, Perthes, Verrall, Dunlop, Lauenstein, Klapp, Lyle, Nicoladoni, and Albee.

ROBERT V. FURSTON, M.D.

Mezzari, A.: The Surgical Treatment of Tuberculosis of the Knee (Il trattamento chirurgico della tubercolosi del ginocchio). *Arch. ital. di chir.*, 1930, xxvii, 872.

The author criticizes some of the current methods of surgical treatment of tuberculosis of the knee, including the Menci re, Vignard, and Robertson-Lavalle procedures. He says that in more than 50 per cent of the cases operated upon by the Robertson-Lavalle method the result is an absolute failure. He regards the Dupuy de Frenelle method of lateral grafting as superior to the Robertson-Lavalle operation as it provides for recalcification of the lesions, restoration of osteogenesis, and immobilization. As compared with the strictly conservative methods of rest and heliotherapy, the methods of bone grafting have the advantage of shortening the time required for treatment. The author has tried sympathectomy in five cases without success.

From his review of the different methods of treatment, Mezzari concludes that, in synovitis, the treatment should remain conservative. In osteitis, if the diagnosis is made in time, exeresis by Sorrel's method may prevent extension of the condition to the joint. In osteo-arthritis of the knee the treatment depends on the age of the patient. In childhood, when protracted treatment is possible, it should be strictly conservative—heliotherapy at the seashore or in the mountains combined with orthopedic treatment. In the cases of adolescents whose skeletal development is complete or almost complete and who are busy at work or in school, it

is desirable to shorten the treatment and the more conservative surgical methods may be used. However, the author has not found the results of these methods entirely satisfactory and does not regard these procedures as the methods of choice. In the cases of adults, surgical treatment should be the rule and resection is the method of choice except in beginning cases, in which heliotherapy may be used. Amputation may be necessary if the local and general condition is very poor or the patient is old.

AUDREY G. MORGAN, M.D.

Kuslik, M.: Operative Treatment of Flat-Foot (Operative Behandlung der Plattfussigkeit). *Ortop. i Tramat.*, 1930, iv, 44.

Wreden's school holds operation to be indicated in flat-foot when severe pain persists in spite of conservative measures. The extent of the anatomical changes is not the important factor in the decision. Correction of the malformation is necessary only when the subjective symptoms are due primarily to exposure of the medial plantar nerve to continual pulling by the sinking of the longitudinal arch and the valgus position of the heel. As is well known, severe pain may occur without visible anatomical changes. On the other hand, secondary arthritic changes may be responsible for the pain and such changes would be only made worse by forcible intervention. Because of the lack of a generally recognized classification of flat-foot according to the degree of the deformity and the functional character of the trouble, it is difficult to give definite advice with regard to the advisability and method of operation.

In Wreden's clinic, the cases are divided into three classes. In the first class are placed cases without bony changes. In these, the foot is over-corrected manually, immobilized in plaster of Paris for from two to three weeks, and then given the usual after-treatment. If the pain persists, the medial plantar nerve is blocked with alcohol or a neurotomy with subsequent suture is done.

In the second class are placed cases with moderate abduction of the anterior portion of the foot and slight skeletal changes, in which manual correction still seems to offer good prospects. In addition to such correction, the tendon of Achilles is lengthened subcutaneously by Baeyer's method, the tibialis anticus muscle is shortened, and the tendon of the peroneus longus is transplanted under the osteoperiosteal bridge of the scaphoid. If Morton's foot symptoms due to flattening of the transverse arch are present, the tendon of the external hallucis longus is displaced to the third metatarsal. The patient is first allowed out of bed two weeks after the operation. For a month thereafter he wears a plaster boot. At the end of that time, the usual after-treatment with inlays, massage, and exercises is begun.

In cases of the third class, those with marked deformity, no procedure other than open operation is attempted. The author recommends particularly

the removal of narrow wedges, with a medial base and spherical surface, from the anterior segment of the talus and calcaneus, by means of chiseling through "in sickle shape." During the correction, the convex surfaces slide over the concave surfaces and make possible a correct position without much sacrifice of bone. Afterward, the tendon of Achilles is lengthened, the tibialis tendon is shortened, and, if necessary, the tendon of the peroneus longus is displaced to the medial border of the foot.

Twenty-nine patients have been operated on in accordance with these principles. Four males and six females belonged in the first class; seven males and three females in the second; and eight males and one female in the third. Except in the cases of three men, all of the interventions were bilateral. The patients were re-examined up to as long as seven years after the operation. Many of them showed perfect permanent results in spite of hard work. There were only two failures, and both of these were due to technical errors. Three patients still had pain because of arthritic changes.

E. OSTEN-SACKEN (Z).

FRACTURES AND DISLOCATIONS

Weinberg, E. D.: Pathological Fracture. *Radiology*, 1931, xvi, 282.

Of 1,700 cases of bone tumors of all types, benign and malignant, pathological fracture was found in 160. Pathological fracture occurs most frequently in cases of tumors characterized by marked bone destruction. Sixty-two per cent of the fractures reviewed occurred in cases of multiple myeloma; 45 per cent, in cases of bone cysts, and 33 per cent, in cases of metastatic carcinoma. They were much more frequent in cases of metastases from carcinoma of the breast than in those of metastases from carcinoma of the prostate. Of 55 cases of bone cysts, fracture was the symptom of onset in 38. Of the 15 cases of giant-cell tumor, on the other hand, it was preceded by pain, swelling, stiffness, and trauma in all but 1. In none of the cases of primary or metastatic sarcoma was fracture the first symptom.

Pathological fracture occurs most frequently in the femur and next most frequently in the humerus. When it is the symptom of onset in a case of central lesion of the shaft of a long bone in a young person it suggests bone cyst, when it occurs in the rib of an adult, it suggests multiple myeloma, and when it occurs in a long bone showing a cartilaginous lesion with bone destruction it suggests chondrosarcoma.

Ossification or healing of pathological fractures varies greatly. In cases of bone cysts, healing always occurs, and if the fracture is sufficiently extensive it may ossify and cure the cyst under treatment by immobilization. In cases of giant-cell tumor, healing seldom occurs, but splinting and X-ray treatment should be tried. Curettement and cauterization or excision may be necessary.

In the cases reviewed, no malignant lesion was found in the bones of the hands or, with the excep-

tion of the os calcis, in those of the feet. The majority of pathological fractures in the hands and feet are due to chondromata or bone cysts, and a few are due to giant-cell tumors. Therefore such fractures may be treated first by immobilization. If union does not occur under this treatment, curettement and cauterization with zinc chloride are indicated. In cases of sarcoma and metastatic carcinoma, pathological fracture is an indication for resection or amputation since bony union cannot be expected.

CHESTER C. GUY, M.D.

Lovisatti, N.: The Behavior of the Callus of Fracture in Irradiated Bones (Il comportamento del callo di frattura nelle ossa irradiate). *Radiol. med.*, 1931, xviii, 1.

The osseous tissue has generally been considered moderately sensitive, and that of adults only slightly sensitive, to radium irradiation.

The author irradiated the right forelegs of nine rabbits. Thirty days later in the cases of three of the animals, and sixty days later in the cases of the six others, he broke the right and left radius, leaving the ulna intact to preserve function. In both groups of animals the formation of callus occurred within from twenty to twenty-five days in the control radius, but required from ten to forty days longer in the irradiated radius. Moreover, the amount of callus formed was less in the irradiated radius. However, no marked differences were noted in the process of repair in the animals irradiated thirty and sixty days respectively before the fracture. The reaction seemed less strong in the adult animals than in the young animals.

The findings in these experiments are attributed by the author to latency of the action of the irradiation. The literature reports a considerable number of cases in which lesions from irradiation were not manifested until months or years after the treatment, the regions of irradiated skin, which were apparently normal for that length of time, then becoming the site of extensive ulceration under the influence of traumatic factors such as ultraviolet irradiation.

By some, these tardy lesions are believed to be due to vascular changes. Whether this theory is correct or not, it is certain that the osseous cells, surrounded by calcium, are subjected to secondary irradiation from the calcium in addition to the primary irradiation. It is difficult to decide whether the delay in the consolidation is due to a change in the cells governing callus formation or to vascular lesions. Both factors probably co-operate, but in the author's opinion the former is the more important.

WILLIAM W. WHITELOCK, Ph.D.

Oltremare, J. H.: The General Mechanism of Injuries of the Wrist Joint (Mécanisme général des traumatismes du poignet). *Schweiz. med. Wchnschr.*, 1930, ii, 1060.

The mechanism of injuries to the wrist joint is exceedingly complex as even traumata which cause

no distortion, dislocation, fracture, or vascular or nerve injury are always followed by certain disturbances (Kienboeck's disease, etc.). After from two to three weeks a disturbance in the movement of the joint is noted, the bones become sensitive to pressure, and with a gradual increase in the symptoms the patient ultimately becomes unable to use his hand. In the beginning the roentgenogram shows a normal bone structure, but later it discloses rarefaction and atrophy far beyond the original site of the trauma. Histological examination of the bones shows first a rarefaction with marked vascularization and later atrophy of the bone trabeculae with widened meshes of spongiosa and fat marrow. After a single or repeated trauma of the metacarpus a local as well as a general osteoporosis with secondary malacia and terminal sclerosis, usually in the semilunar and scaphoid bones, may develop. The changes are due to a disturbance in the vascularization of the bone injured by the trauma. This is initiated by a short phase of vasoconstriction (anæmia) which quickly follows protracted vasodilatation. The rarefaction begins with the onset of the hyperæmia in the bone. The result is an osteoporosis which becomes manifest after from three to four weeks.

In the occurrence of fractures of the bones of the wrist, the position of the hand at the moment of the accident is decisive. If the hand is extended, the articular surface of the radius is touched only by the scaphoid and semilunar bones. If the hand is in volar flexion, the proximal row of carpal bones move in a dorsal direction as does also the head of the os magnum, whereas the base of the latter and the distal row of carpal bones is displaced in a volar direction. At the same time the scaphoid bone turns upon its own axis, with one pole in a dorsal direction to the semilunar bone and the other in a volar direction to the base of the os magnum. If the hand is in dorsal flexion, the chief point of pressure is at the lower pole of the scaphoid bone. The upper pole of the bone moves dorsally and the semilunar bone moves in a volar direction. If the hand is in adduction the entire wrist joint is displaced around a dorsovolar axis passing through the head of the os magnum. The scaphoid bone glides under the styloid process of the radius and the semilunar bone slips posteriorly under the radius. In abduction of the hand, the scaphoid bone is displaced entirely under the radius and the semilunar bone under the inner border of the radius. Therefore, according to the position of the hand at the moment of the accident, the possibilities as regards fracture are as follows:

1. In a fall on the extended hand (very rare), the force is transmitted from the metacarpal bones to the os magnum. If the carpometacarpal joint remains intact, the semilunar bone is crushed upon the articular surface of the radius or the latter is fractured. If the carpometacarpal joint is ruptured, the os magnum slides dorsally, the forearm presses the proximal row of metacarpal bones forward, and

an intercarpal dislocation with dislocation or, more often, fracture of the scaphoid bone results.

2. In a fall on the hand in volar flexion the carpus is forced against the anterior border of the radius. If the latter gives way, a fracture of the anterior border of the radius or separation of the epiphysis results. If the anterior border of the radius holds, a fracture of the scaphoid bone in the center or a fracture of the head or base of the os magnum with subluxation of one or several metacarpal bones results, or, exceptionally, the wrist joint ruptures, whereby the semilunar bone is displaced in a volar direction and the scaphoid bone is displaced dorsally.

3. In a fall on the dorsiflexed hand the results differ according to the degree of the dorsiflexion and the adduction or abduction of the hand. With dorsiflexion up to 45 degrees, a posterior marginal fracture of the radius or a fracture of the epiphysis results. With dorsiflexion up to 90 degrees, the radius remains unharmed and there results either a fracture of the scaphoid bone or a dislocation of the carpus (the semilunar bone being displaced in a volar direction and the os magnum in the dorsal direction). If the hand remains in the middle position, the scaphoid and semilunar bones come into contact with the radius and a Y- or V-shaped fracture of the radius results, possibly with a fracture of the semilunar and scaphoid bones. In radial adduction of the hand the scaphoid is the only carpal bone coming into contact with the radius and receives the entire force. A fall with the hand in this position may therefore result in a fracture of the scaphoid bone or of the styloid process of the radius or an oblique fracture through the epiphysis, possibly with avulsion of the styloid process of the ulna and, under certain conditions, a fissure in the cuneiform bone. In ulnar abduction of the hand the semilunar bone is in contact almost exclusively with the radius. A fall with the hand in this position may therefore result in a fracture of the inner border of the radius or a dislocation of the semilunar bone in a volar direction and of the os magnum in a dorsal direction. When the motors of automobiles were cranked, fractures of the lower border of the radius occurring in free extension of the hand were frequent. Traumatic dislocation of the semilunar bone is due usually to a fall on the hyperextended hand resulting in laceration of the bone or of the ligamentous apparatus. If the ligaments remain intact, the scaphoid bone is fractured, but if the ligaments rupture, slight pressure of the os magnum upon the semilunar bone will be sufficient to dislocate the latter in a volar direction.

TÖBLER (Z).

Magnant, J. S.: Fractures of the Odontoid Process of the Axis (Les fractures de l'apophyse odontoïde de l'axis). *Rev. de chir.,* Par., 1931, 1, 13.

Magnant reports two cases of fractures of the odontoid process of the axis and shows the relations of the bone to the soft parts by drawings. Fractures of this type are due to the form and anatomical position of the bone which forms a bridge between

the axis and atlas. They seem to be caused by two different mechanisms: a sudden change in the curve of the spinal column and avulsion by the ligament. In some cases the diagnosis is extremely difficult and can be made only by roentgen examination.

Even when the symptoms are very slight there may be serious early or late complications if the proper treatment is not given. Sudden dislocation of the atlas may cause death from compression of the medulla and such an accident may be of great medicolegal importance. In all cases in which there is any possibility of an injury of this type the patient should be kept under observation.

The only treatment is long-continued immobilization. A plaster collar may be replaced later by a collar of celluloid or re-inforced leather. If, in spite of these precautions, a series of roentgenograms shows intense decalcification or progressive subluxation of the atlas or if the patient complains of stiffness or persistent pain, a graft is indicated.

AUDREY G. MORGAN, M.D.

ORTHOPEDICS IN GENERAL

Huggins, C. B.: The Formation of Bone under the Influence of Epithelium of the Urinary Tract. *Arch. Surg.*, 1931, xxii, 377.

In experiments carried out on dogs, the author demonstrated the formation of bone as a result of the direct influence of certain epithelial cells on connective tissue. Bone formed in fascia transplanted to the bladder from which the urine was diverted and around epithelium from the bladder, ureter, and renal pelvis which was transplanted to certain parietal fasciæ and to muscle and synovial membrane.

The essential factor in this osteogenesis was the newly formed epithelium of the transplant. Another factor was probably the secretion of fluid containing a large amount of calcium and phosphorus into epithelium-lined cysts of the mucosa of the bladder in the rectus sheath of the dog.

ELVEN J. BERKHEISER, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Kilbourne, N. J.: Varicose Veins: Indications and Contra-Indications to Injections. *Ann. Surg.*, 1931, xciii, 691.

The author states that major complications following the injection treatment of varicose veins are occurring with such frequency that a warning is imperative. Thrombo-angiitis, which is often associated with varicose veins, is a contra-indication to the injection treatment. Preliminary examination must therefore determine whether the dorsalis pedis and posterior tibial arteries are pulsating.

A large group of persons with varicose veins are elderly. The injection treatment may be used in the cases of vigorous elderly persons in good health, but when some other serious handicap is added to senility, this treatment is associated with danger. Simple debility in old age may constitute a contra-indication. Other factors contra-indicating the injection treatment when associated with old age are diabetes, a very high blood pressure, a history of embolism or thrombosis in the coronary or cerebral arteries, and severe focal infection. The injection treatment is contra-indicated also by a past history of phlebitis if there is danger that the injection will stir up the old phlebitis.

SAMUEL KAHN, M.D.

Delater, G., and Chailly, M.: Old Phlebitis and the Fibrosis Cure of Varices (Phlébite ancienne et fibrose curative des varices). *Presse méd.*, Par., 1931, xxxix, 95.

The authors review 131 cases of old varicose phlebitis. They divide the cases into 2 groups—52 of superficial phlebitis and 79 of deep phlebitis.

The patients with superficial phlebitis were given sclerosing treatment with excellent results. In 28 cases the cause of the condition was unknown. In 6 cases it was typhoid fever; in 5, a respiratory infection; in 3, appendicitis; in 3, pregnancy; in 2, urinary infection; in 2, trauma; in 2, an infected wound; and in 1, a gynecological operation.

In 57 of the 79 cases of deep phlebitis the condition followed labor; in 12, a gynecological operation; in 2, an appendectomy; in 2, typhoid fever; in 1, pneumonia with purulent pleurisy; and in 1, the repair of a strangulated hernia. In 4 the cause was unknown. The sclerosing treatment gave an excellent result also in the 44 cases of this group in which it was used.

Certain indications and tests of vessel patency are of interest. In no instance was the treatment given until there had been freedom from all symptoms of infection for two years and there was positive evidence of patency of the deep venous channels. When the patency of the deep veins was doubtful the test of Delbet and Mocquot—occlusion of the

superficial venous return by the application of a ligature at the top of the thigh—was employed. If the deep venous channels were patent the varices disappeared during exercise. In cases with œdema so marked that there was difficulty in palpating the varices, a boot made of bandage impregnated with Unna's paste was applied snugly from the base of the toes to the upper part of the leg and left on for from six to ten days.

JAMES B. MASON, M.D.

Huard, P., and Montagne, M.: Ligation of the Superior Gluteal Artery in the Cadaver and in the Living (La ligature de l'artère fessière sur le cadavre et sur le vivant). *J. de chir.*, 1931, xxxviii, 27.

The authors review 55 cases from the literature and report 3 cases of their own in which ligation of the superior gluteal artery was required. They describe the incisions used by others for exposure of the superior gluteal artery in the cadaver and in the living.

With regard to the frequency of hæmorrhage from the gluteal vessels, the authors state that the head of a medical division of the French army saw no severe lesions of these vessels during eleven months of active war service. However, the literature reports about 100 cases of traumatic aneurism of the gluteal artery. Causes of bleeding from the superior gluteal artery are stab wounds, surgical accidents, incisions into abscesses, débridement of fistulæ, the extraction of bullets, surgery of tumors of the pelvic bones, septic ulceration, and bullet wounds.

The clinical picture shows 2 stages. During the first few hours after the injury the bleeding is controlled by the gluteal muscles and there is no indication of hæmorrhage. In the second stage there is a rise in the temperature with malaise, vasomotor disturbances, a feeling of weight in the gluteal region, and bleeding from the wound. The blood may be bright and profuse or black and scant. In several of the cases reviewed the hæmorrhage followed a fit of coughing or defæcation many days after the injury.

The mortality has been reported as high as 40 per cent, but is difficult to determine because of the variable factors of neglect and infection. By some, no distinction is made between lesions to branches of the artery and lesions of the main trunk. The authors believe that death results in practically all cases in which the bleeding is neglected. The cause of death is often a complication of the hæmorrhage. Two of the authors' patients who were not seen until forty-eight hours after the injury died from sepsis.

The technique of ligation of the superior gluteal artery is described. The skin incision is made on a line joining the midpoint between the 2 posterior spines of the ilium and the greater trochanter to a

point a little more than two-thirds of the way to the trochanter and then curved posteriorly slightly over the sacrum. The adjacent fibers of the gluteus maximus are split and retracted and, beginning laterally, the upper border of the piriformis muscle is separated. The sciatic nerve is recognized by touch. Care is taken to avoid a descending branch of the superficial ramus of the superior gluteal artery to the gluteus maximus. As the sacrum is approached it must be borne in mind that the piriformis has a tendon of origin common to other muscles, beyond which it will not separate. This tendon is separated to a variable degree from the ilium. Sponging is then done to determine whether the source of the bleeding is a branch or the trunk of the artery.

If the source is a branch, the attempt is made to ligate the branch at its origin. The piriformis is separated from the posterior aspect of the greater sciatic foramen, the bundle of veins in front of the artery and its branches being thus exposed. The artery is isolated from these veins or, if necessary, the veins are ligated with it. If the exposure is still insufficient, some of the adjacent ilium is resected or the gluteus medius is divided somewhat above the foramen and separated from the ilium down to the foramen.

If the source of the bleeding is the trunk of the artery, hemostasis is more difficult as the lesion is often within the pelvis. With the left index finger the vessel may be pressed against the internal aspect of the ilium until the field is clear. Clamps are then placed blindly through the foramen, the jaws being kept in close contact with the inner surface of the ilium to avoid injury to the sacral plexus. If it is desired to place the forceps on the vessel under direct vision, a block of the ilium is resected. For more complete exposure of the intrapelvic structures, the sacroscopic ligament is divided or a piece of the sacrum is resected. When the bleeding cannot be controlled with forceps, packing is done.

Of the authors' three cases the first was a cold abscess with a fistula into the right sacro-iliac joint. There were no pulmonary lesions. During curettage of the fistula the wound became flooded with blood. Digital pressure and sponging showed that a branch of the superior gluteal artery was the source of the hemorrhage. The branch was successfully ligated, but the bleeding did not stop entirely until another profusely bleeding branch was found and ligated.

The authors' second and third cases were those of soldiers wounded in the Moroccan service who were not seen until forty-eight hours after the injury, when severe infection had developed. In one case the bleeding began during débridement of a bullet wound, and in the other during the removal of bone fragments from a fractured ilium. In one case the artery was reached behind the venous plexus by turning down a flap of the gluteus medius. In the other, it was impossible to clamp the vessel without clamping the sciatic nerve, but the hemorrhage was controlled by packing. CURTIS NELSON, M.D.

BLOOD; TRANSFUSION

Wildegans: Deaths Following Blood Transfusion (Todesfälle nach Bluttransfusionen). *Zentralbl. f. Chir.*, 1930, p. 2805.

In discussing the causes of death following blood transfusion, which have become more frequent of late, the author states that the value of the preliminary tests is not absolute. In every 1,000 blood transfusions there are 1 or 2 fatalities. The causes include avoidable errors and sources of danger that cannot be anticipated. The source of error in blood grouping may be in the technique of the test or in the sera used. Error may arise from reliance on the stability of the test serum. Incorrect positive readings may occur as a result of pseudo-agglutination, and incorrect negative readings in the presence of a very weak iso-agglutinin or insufficiently sensitive erythrocytes. Variations from the accepted scheme of grouping occur. In defective types of blood certain normal characteristics of the blood are lacking or there are agglutinins which do not exactly fit into the accepted scheme. The erythrocytes of the donor must not agglutinate with the recipient's serum and the recipient's erythrocytes must not be agglutinated by the donor's serum.

When the blood transfused is that of a universal donor there is special danger to patients whose blood-forming organs have suffered injury (aplastic form of pernicious anemia, hemolytic icterus) and to very much weakened and cachectic persons. If the blood of the donor is not sufficiently diluted by the blood of the recipient, a catastrophe may result. Marked reduction of the blood volume may be recognized by the decline in the hemoglobin percentage when a measured quantity of salt solution is infused.

Exact determinations of the blood volume may be made on the basis of the oxygen and water content of the blood. If the blood volume of the patient is much reduced, the agglutination titer of the donor's blood must be carefully determined. It is best to reject the universal donor and employ a donor belonging to the same group as the recipient. However, even this does not always prevent accidents. Accidents occurring under such circumstances may be attributed to auto-agglutination (e.g., in icterus, pneumonia, anemia, cachexia, and lues) and to pan-agglutination in bacteremias. An acute hemolytic crisis may occur immediately after the transfusion, a fatal delayed reaction from one to four hours later, or a constitutional reaction due to the foreign protein.

Accordingly, it is justifiable to doubt whether our confidence in the practical value of the theory of agglutination can continue. Direct study of the bloods always has special advantages over the determination of blood groups. The chief causes of death are the effects produced in the kidneys, liver, heart, and blood vessels by the breaking down and disposal of the foreign substances (the donor's blood). Death frequently occurs with symptoms of uræmia produced by hemoglobin infarcts and obstruction of the tubules of the kidney by hemo-

globin casts. In the presence of anuria or oliguria, decapsulation of the kidney is advisable. Hemorrhages in the serosa and mucosa, bloody serous effusions into the pleural cavities, and punctiform hemorrhages seen in cross-sections of the brain at autopsy indicate toxic factors, especially when necrotic foci are present in the parenchyma of the liver. A fatal reaction is more frequent in the presence of blood disease and sepsis than in cases of acute exsanguination. The mortality is higher when the citrate method of transfusion is used than when the transfusion is done directly. In cases of valvular or muscular insufficiency of the heart a large quantity of blood too rapidly infused may induce sudden paralysis of the cardiac musculature. It is doubtful whether agglutination always precedes hemolysis. There is much to suggest that hemolysis may occur independently. Therefore the determination of the blood group, based solely on the phenomenon of agglutination, is not a sufficient safeguard and must be supplemented by a test for hemolysis.

In the discussion, LANDOIS reported a fatality following blood transfusion done for the relief of severe anemia caused by a large myoma. The blood was obtained from a universal donor (Group 4). The patient's blood belonged to Group 2. The amount of blood transfused was 350 c.cm. On the day of the transfusion the patient had a chill and developed a fever of 102.2 degrees F. The next day there was hemoglobinuria (oliguria of from 70 to 80 gm.). On the advice of the internist, decapsulation was not done. Coma resulted, and death occurred seven days after the transfusion. Today, in such a case, Landois would do an immediate decapsulation, at least on one side. ERICH HEMPEL (Z).

LYMPH GLANDS AND LYMPHATIC VESSELS

Albot, G., Decourt, P., and Soulas, A.: The Circumscribed Pulmonary Form of Malignant Lymphogranulomatosis. A Study of the Permeability of the Bronchi (Forme pulmonaire circonscrite de la lympho-granulomatose maligne. Etude de la perméabilité bronchique). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1937, xlvii, 77.

The authors call attention to the facts that Hodgkin's disease may be manifested by a circum-

scribed rounded intrapulmonary mass, and that, at least in the early stages, there may be no discernible adenopathy. The circumscribed pulmonary form is rare and is apt to be confused with primary lung tumor. Only the absence of bronchial stenosis makes it possible to rule out early carcinoma of the lung.

W. P. VAN WAGENEN, M.D.

Levin, I.: Lymphoma Malignum (Hodgkin's Disease) and Lymphosarcoma: Pathogenesis, Radiotherapy, and Prognosis. *J. Am. M. Ass.*, 1934, xcvi, 421.

From a clinical and pathological study of more than 500 cases of lymphoma malignum (Hodgkin's disease) and lymphosarcoma, Levin concludes that these conditions are malignant tumors. He believes that they represent different phases of a pathological entity which begins as a purely local condition in a lymph node and that the two may exist in the same patient or even in the same region simultaneously. Inflammatory lymphadenitis may be a precursor of both. Even in the earliest localized stages of the disease, all of the other groups of lymph nodes and all of the lymphoid tissue must generally be considered potentially malignant since in all cases the condition ultimately becomes generalized.

Radiotherapy has been found very beneficial. The lymphoid tumors of lymphoma malignum and lymphosarcoma represent the most radiosensitive of any tissue in plants and animals. When the treatment is begun in the early stages of the disease, life may be prolonged for many years. Even in far advanced stages excellent temporary palliative results are frequently obtained. Levin prefers radium for the localized involvement of peripheral groups of lymph nodes and roentgen therapy for the generalized condition of the chest and abdomen. Not only the involved area but also the areas that are potentially malignant should be treated.

In conclusion the author says that if cases of lymphoma malignum and lymphosarcoma were diagnosed early and treated by correct methods of radiotherapy the results obtained by radium and roentgen therapy would become superior to those obtained today, the prognosis would be greatly improved, and life would be considerably prolonged.

ELIZABETH CRANSTON.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Koenig, W.: The Appearance of "Early Poisons" (H. Freund) in Surgical Operations (Ueber das Auftreten von "Frühgiften" (H. Freund) bei chirurgischen Operationen). *Klin. Wchnschr.*, 1930, ii, 205a.

A filtrate made from ground-up freshly excised muscle and immediately injected into an animal in very small quantities produces severe lowering of the blood pressure, and in slightly larger quantities is fatal. If this muscle extract is allowed to stand in the test tube for from thirty to sixty minutes, its effect disappears. It is therefore apparent that during the disintegration of muscle tissue, transient toxins are formed which are comparable to the early poisons found by Freund in defibrinated blood. They must be formed in every operation in which tissues are killed, especially by ligatures, and in every trauma which is associated with tissue destruction. These early poisons are therefore the cause of the fall in the blood pressure which, after operations, appears slowly and persists for a period of time corresponding to the slow death of cells, and, after severe crushings, is sudden and fatal (wound shock).

According to Zipf and Wagenfeldt, the pharmacological action of the early poisons consists in a disturbance of the greater and lesser circulations which leads to stasis in the lungs and extremities. The author expresses the view that the early toxins in this way favor the development of postoperative pneumonia and thrombosis. This theory is confirmed by the studies of von Saily and of Dietrich and Schroeder on the action of early poisons and protein bodies on the vessel walls, and also by Ipson's finding that the temperature of the sole of the foot is increased after operations. This elevation of the temperature of the sole of the foot indicates the importance of the plantar venous plexus, in which, according to Payr, the first signs of thrombosis are often to be noted. W KOENIG (Z).

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Bates, W.: Electrocauterization in the Treatment of Human Bites. *Ann. Surg.*, 1931, xciii, 641.

Bates reports the results obtained in over 100 cases of human bite infection treated by electrocauterization. In wounds caused by a human bite the tissue is crushed and implanted with the many virulent organisms found in the mouth. There does not appear to be any uniform type of infection present, and none of the cultures made by the author revealed the bacillus fusiformis and its symbiotic

spirochete. The wounds quickly show a foul-smelling infection, a green sloughing edge, and extension of the infection into soft tissue, bones, and joints.

The treatment of these wounds has been unsatisfactory, frequently entailing long hospitalization and numerous incisions and occasionally necessitating amputation. Bates recommends electrocauterization under gas anesthesia immediately after the injury is received. Penetrating wounds are completely excised; avulsed wounds and amputations are cauterized over the whole raw surface. The débridement is thorough, even to the point of sacrificing a tendon. Following cauterization, a mild antiseptic dressing is applied. Even on the third or fourth days, electrocauterization may be used successfully.

In the more than 100 cases reviewed, extension of the infection occurred but once. The patients did not require hospitalization, the wounds were healed after from fourteen to twenty days, and much less scar was left than after excision.

MICHAEL L. MASON, M.D.

ANESTHESIA

Bond, W. R., and Bloom, N.: Studies on the Toxicity of Alpha-Butyloxy-Cinchoninic Acid Diethyl-Ethylene-Diamide Hydrochloride (Nupercaine). *J. Lab. & Clin. Med.*, 1931, xvi, 447.

Considerable interest has been evinced in a new local anesthetic, alpha-butyloxy-cinchoninic acid diethyl ethylene-diamide hydrochloride, which is known in Europe as "percin" and in America as "nupercain." When nupercain is injected subcutaneously the minimal fatal dose for guinea pigs is approximately 20 mgm., and the minimal fatal dose for dogs 25 mgm., per kilogram of body weight. The intravenous fatal dose for dogs is between 2.5 and 3 mgm. per kilogram.

Experiments by the authors showed that nupercain is absorbed rapidly from the nasal and buccal mucosa, but very poorly from the bladder and vaginal canal.

Contrary to investigations previously reported, the authors' studies seemed to indicate that nupercain is quite rapidly detoxicated *in vivo*.

GEORGE A. COLLETT, M.D.

Friedlaender, B.: Pernocton Sleep. *Am. J. Surg.*, 1931, xi, 485.

The author first briefly reviews the chemical, physiological, histological, biological, and psychological theories of sleep. He believes that the mechanism of sleep and the action of pernocton are best explained by the psychological theory.

Sleep is an inhibition of consciousness resulting from the lowering of mental activity which occurs when incoming peripheral stimuli are absent. It is voluntarily induced by cutting off external stimuli, as by darkening the room and stopping muscular activity. It is therefore to a certain extent volitional. Consciousness is an active process of centering attention on a limited number of stimuli which results in a continuous association of impressions and ideas. Unconsciousness is the state existing when such a synthesis is absent. The suppression of the synthesis of ideas varies from mental concentration through reverie, trance, the hypnotic state, and sleep to anæsthetic narcosis and coma.

Prior to the administration of pernocton, the patient is prepared by being told repeatedly of the safety and pleasant action of the drug. This preparation produces a mental state favorable for the induction of sleep and helps prevent psychic trauma. Pernocton prevents the synthesis of impressions and causes a state one step beyond natural sleep as the patient cannot be aroused by ordinary stimuli.

The author recommends the use of pernocton for the induction of anæsthesia on the basis of the results in 1,200 cases. He believes that the desired goal of a safe, easily controlled anæsthesia which, at the same time, preserves the psyche has been reached by combining pernocton with an inhalation anæsthetic, preferably ether. The use of pernocton alone for anæsthesia is dangerous as large doses cause respiratory failure and a fall in the blood pressure. The recommended dosage of 1 c. cm. of a 10 per cent solution per 12.5 kgm. of body weight is the safe limit, and usually only from one-half to three-quarters of this dosage is necessary. The drug is injected intravenously at a rate of not more than

1 c. cm. every one or two minutes, and the injection is stopped if the patient falls asleep before the full dose is given. Twenty minutes after the injection, a small amount of ether is given. No morphine is administered in the pre-operative preparation, but from 0.4 to 0.6 mgm. of atropine is given half an hour before the operation. The normal sleep after the operation lasts from two to five hours and reduces postoperative pain. The estimated safe dose should never be exceeded, and the reflexes should not be abolished.

With the use of pernocton, painful examinations, minor surgical operations, and many obstetrical procedures may be carried out without further anæsthesia. In obstetrics, pernocton may be given to primiparæ when the os is dilated to three fingers, and to multiparæ when the os is dilated to two fingers. In protracted labor, a second dose not to exceed 2 c. cm. may be given.

When the solution is properly administered there is no failure and no excitation. The patient loses all sensation in one or two minutes without preceding dizziness, anxiety, or fear. No change is noted in the patient except that he does not answer questions. Pernocton sleep is shortened by the administration of oxygen or carbon dioxide or the hypodermic injection of a caffeine preparation. The patient awakens naturally and without remembrance of the anæsthetic. There is no nausea, vomiting, or excessive thirst. From 60 to 80 per cent of ether is saved. The use of a mouth gag is unnecessary. No patient has awakened by the exciting cough which occurs when the administration of ether is started. Post-operative accidents and complications such as collapse, pneumonia, lung abscess, ileus, and vomiting have not occurred.

E. S. PLATT, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Holfelder, H.: The Saturation Method of Pfahler and Kingery (Die Sättigungsmethode nach Pfahler und Kingery). *Fortschr. d. Roentgenstrahlen.*, 1930, xlii, 73. *Strahlentherapie*, 1930, xxxvii, 696.

Holfelder gained the impression that the so-called "carcinoma dose" is not sufficient to damage carcinomata permanently. Pfahler and Kingery introduced the saturation method. According to the curve presented by them, the skin may again be exposed to the indicated dose after a certain number of days. By the method of Regaud and Coutard, in which the treatment is begun with a dose smaller than the erythema dose divided over a number of days, considerably more than the Pfahler dose may be administered. In this way it is possible, in from ten to twenty days, to give from 3 to 5 times the carcinoma dose and obtain a reaction of the skin corresponding to only a dose of from 110 to 120 per cent of the skin erythema dose.

In carcinoma of the tongue and the mucous membrane of the mouth the author has seen better results obtained with a modification of the Regaud-Coutard method in which the intensity of the irradiation was reduced by decreasing the milliamperage and increasing the distance. For the administration of 150 roentgen units, from sixty to seventy minutes were required. This dose was repeated daily for from ten to twelve days with great success.

Carcinoma of the gastro-intestinal tract was treated every other day with one-third of the carcinoma dose, the fields being changed so that they were exposed to only from 50 to 60 per cent of the skin unit dose and showed a weak erythema.

In carcinoma of the stomach better results were obtained by methods of irradiation similar to Pfahler's saturation method.

Experiments with regard to erythema which were carried out according to Holfelder's suggestions are summarized by Reissner as follows:

Experiment 1. Single exposure of a field measuring 2 by 2 cm. to 1,000 roentgen units (100 per cent). Erythematous dermatitis on the twenty-eighth day and vesicles on the forty-fifth day. With this test field the erythematous obtained in subsequent experiments, measured with the Schalla-Alius erythema measure, were compared.

Experiment 2. The same as Experiment 1 except for saturation with 150 roentgen units on the fourth and eighth days. In the beginning the curve was the same, but on the forty-fourth day the inflammation was somewhat more marked.

Experiment 3. The same as Experiment 1, but with saturation on the third and fifth day with 80 roentgen units and on the eighteenth day with 120

roentgen units. The resulting erythema was somewhat more marked than that in the control field.

Experiment 4. Initial dose, 800 roentgen units; third day, 160 roentgen units; fifth day, 70 roentgen units; eighth day, 150 roentgen units; and tenth and twelfth days, 70 roentgen units each. The erythema was milder than in the control field, and the greatest reaction occurred later and was less severe.

Experiment 5. Initial dose, 700 roentgen units; third day, saturation to 1,000 roentgen units (250 roentgen units according to Pfahler); fifth, eighth, tenth, and twelfth days, saturation with 80, 120, 80, and 80 roentgen units respectively. The effect was less than that in the control field.

Experiment 6. The same as Experiment 5 except that the 4 saturation doses were given daily. The effect was surprisingly mild. The highest point, 12 erythema degrees, was not observed until the fiftieth day.

All of the experiments were made on the same patient.

In the discussion, CHAOUL reported that the protracted method of irradiation is used at the Berlin Surgical Clinic. It has been employed in 154 cases. The factors were: 180 to 200 kv., 3 mm. of copper, and 4 ma. In the cases of 40 patients who were given 2,200 roentgen units in fourteen days there was no erythema, and in the cases of 66 patients who were given 3,300 roentgen units in three weeks there was only an occasional slight erythema. KRAUSE (G).

Osborne, E. D., and Putnam, E. D.: The Treatment of Warts. *Radiology*, 1931, xvi, 340.

Having treated 765 patients for warts in the past three years, the authors are convinced that the occurrence of warts is increasing. The parts of the body most commonly involved are the plantar surfaces, the hands, the face, and scalp. The increased incidence of plantar warts, which constituted 40.6 per cent of the warts treated in the authors' cases, is attributed to infection in dressing rooms, bathrooms, and runways. In 87.71 per cent of the author's cases of plantar warts a cure was obtained by roentgen irradiation. Thirteen patients with plantar warts who were not cured by the roentgen rays were cured by electrocoagulation. Roentgen irradiation is preferable to radium in cases of plantar warts because it requires less time, it permits the treatment of a larger area at one irradiation, it causes fewer skin reactions, and it is less liable to be followed by disagreeable reactions due to movement of the foot. The authors pare off keratotic skin layers over the warts, immobilize the foot, cover the normal skin with lead foil, and administer a single massive dose of from 2 to 8 skin units. They employ a 6-in. spark gap, 6 ma., and an 8-in. skin-target

distance. Plantar warts that do not react to one or two maximum doses should be treated by other means. Warts in parts of the body other than the feet have reacted well to smaller doses of roentgen irradiation. X-ray treatment is contra-indicated by a damaged peripheral circulation.

In 50 per cent of the cases in which they have tried it, the authors have obtained good results also from sulpharsphenamine. This is indicated in cases in which there are large numbers of warts on the face, neck, and hands. The best results are obtained in the cases of patients past the age of puberty.

CLARENCE V. BATEMAN, M.D.

MISCELLANEOUS

Mortimer, B.: *Experimental Hyperthermia Induced by the High-Frequency Current. Radiology*, 1931, xvi, 705.

The author studied the biological effects of electromagnetic waves emitted by a vacuum-tube oscillator at frequencies between 10,000 and 14,000 kilocycles per second.

The electrostatic field between the plates was not homogeneous, the heating effect varying in different parts of the field.

Sublethal doses given to rats daily for a month and to a dog daily for two months were without ill effects. The histological changes were those found in animals subjected to hyperthermia induced by other means.

The histological changes produced by the lethal doses closely paralleled those occurring in fatal cases of heat prostration.

The blood-chemistry changes observed in dogs subjected to sublethal doses were very similar to the blood changes noted in the diathermy experiments. The calcium was unchanged or rose, the chlorides were increased or decreased, the carbon-dioxide combining power was decreased markedly, and the total solids, non-protein nitrogen, and uric acid were increased.

In the anesthetized dog with viscera exposed, the different organs heated up at approximately the same rate, the blood serving as a very efficient distributor of the generated heat. In the dead dog, the different organs heated up at different rates.

The author concludes that the effects produced on animals by the diathermy current and the electromagnetic waves emitted by a vacuum-tube oscillator can be fully explained on the basis of the heat generated by high-frequency currents.

SAMUEL KAHN, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Picó, G., and Vicente, I.: Investigations of Normal and Pathological Blood Calcium (Estudios sobre calcemia normal y patológica). *Arch. de med. cirurg. y especial.*, 1931, xii, 49.

As the result of investigations of the blood calcium of patients suffering from various diseases, the authors reach the following conclusions:

1. The technique of Clark and Collip may be regarded as sufficiently accurate for the determination of the calcium content of the blood. This technique is as follows: In 2 c. cm. of serum the calcium is precipitated by 1 c. cm. of a 4 per cent solution of ammonium oxalate. After standing for half an hour, the precipitate is centrifugalized, washed with 2 per cent ammonia, again centrifugalized, and then treated with a 2 per cent solution of normal sulphuric acid, which sets free the oxalic acid. The amount of the free acid is determined by boiling with centinormal potassium permanganate, the volumetric method.

2. Repeated washing with ammonia is essential for purification of the calcium precipitate. The test should be made with freshly drawn blood.

3. The normal calcium content of the blood varies between fairly wide limits. In pathological conditions a decisive significance can be attributed only to extreme values. Intermediate values are suggestive only when the normal figure for the subject is known.

4. The disease which reduces the calcium values most is tuberculosis. With proper reservations it is possible to base the prognosis of the disease on periodical determinations of the blood calcium.

5. The calcium content of the blood seems to be low also in certain other diseases such as suppurations, severe infections, and tetany, and in pregnancy.

6. It is probable that the calcium content of the blood is increased by calcium therapy in both normal persons and persons with pathological conditions.

WILLIAM W. WHITLOCK, Ph.D.

King, E. S. J.: The Surgical Importance of "Brown Fat." *Surg., Gynec. & Obst.*, 1931, lii, 665.

The interscapular gland or so-called hibernating gland of animals is found in human embryos and does not entirely disappear after childhood. Its distribution is irregular as it may be found in the neck, axilla, or breast, or the subpleural or perirenal tissues. It has been designated "brown fat" because of its mulberry color, "muruloid fat" because of its microscopic appearance, and "interscapular gland" because of its position in animals.

Diseases occurring in brown fat have seldom been reported. The occurrence of neoplasms has been referred to, but inflammation has not been recorded. Because of the irregular distribution of the brown fat, diseases involving it may occur almost anywhere in the body. Inflammation of the fat may give rise to a definite and more or less localized swelling, for example, in the abdominal wall.

The author reports three cases of tumor of the brown fat.

HOWARD A. MCKNIGHT, M.D.

Ryle, J. A., Smith, R. L., Glibberd, G. F., Knott, F. A., and Others: Streptococcal Infections. *Guy's Hosp. Rep.*, Lond., 1931, lxxxi, 1, 29, 45, 55, 63, 92, 110, 116, 120.

The authors discuss streptococcal fever, acute streptococcal infections of the throat, hæmolytic streptococci in the mastoid, diseases of the skin due to streptococcal infections, and apical infections of the teeth.

Streptococcal fever. Age and sex have little or no influence on the incidence of streptococcal fever. Season has an influence only insofar as it helps to determine epidemics of influenza, exanthemata, throat infections, sinus inflammations, and middle ear disease. Fatigue may play a part. If surgical injuries are excluded, the most apparent causes predisposing to streptococcal fever are other infections and anemia. While staphylococcal fever originates in a surface lesion such as a boil or carbuncle, streptococcal fever may occur without any evident local focus. A needle prick or hangnail may serve as the portal of entry for a virulent infection. Given a virulent infection, the less the lymphatic defenses are called into play the greater the likelihood of a grave general infection.

Rigor or high fever with chilliness and malaise is the first manifestation. The temperature remains high and shows noteworthy diurnal oscillations. The high fever is associated with delirium, prostration, restlessness, vomiting, dryness and redness of the tongue, and splenic enlargement. Four manifestations are peculiarly diagnostic of streptococcal fever: diarrhoea, albuminuria with red cells and casts, rapidly progressive anemia, and a smooth, red, desquamated and sore tongue. The pulse rate is rapid, but the respiratory rate is not high. Various transitory rashes may appear. Venous thromboses occur. There is generally a high leucocytosis. The hæmoglobin falls rapidly to a very low level. Often symptoms of metastases develop. The most common localizations are cavities lined by serous membranes.

In staphylococcal fever there is usually a history of boils or a carbuncle, a slow initial pulse, and a tendency toward the formation of abscesses in the renal cortex and toward osteomyelitis. Splenic en-

largement and primary involvement of the serous cavities are rare.

In streptococcal fever a good prognosis is favored by a surgically accessible focus of invasion, survival beyond the immediate stage of onslaught, a high leucocytosis, and localizations amenable to surgical treatment.

The treatment must include good nursing, a copious fluid intake, watchful care with regard to the development of localizations of the infection, morphine for the relief of pain, and proper immobilization of infected joints. If streptococcal antitoxin is given early enough, it seems to protect against the acutely septicæmic phase of streptococcal infection.

Acute streptococcal infections of the throat. Acute streptococcal infection of the throat is usually due to the streptococcus hæmolyticus. However, persons who are carriers of the streptococcus hæmolyticus are not apt to develop acute sore throat. The streptococcal lesion may be localized to the nose, the nasopharynx, pharynx, or larynx and may lead to a simple hyperæmia or the formation of a membrane, an ulcer, or a slough (gangrene). Treatment with anti-streptococcus serum is strongly advised.

Hæmolytic streptococci in the mastoid. In cases of acute mastoiditis it should be a matter of routine to make cultures of the bone. While the discovery of the exact nature of the invading organism is not likely often to serve as a guide in the treatment of the individual case, in rare instances it may be of great importance.

The great majority of cases of acute mastoiditis are due to the hæmolytic streptococcus. When cultures are made routinely, cases due to other organisms may be more intimately studied and their clinical differences noted.

Many organisms may be cultivated from the chronic running ear, but they do not often include the hæmolytic streptococcus.

It seems that in chronic disease of the mastoid bone there are three stages. In the first, the primary organism, usually the hæmolytic streptococcus, gives rise to an acute bone disease. This organism is then killed off, and the bone is sterile for a period. In the third stage there is a secondary infection, either through the drumhead from the skin of the meatus or through the eustachian tube from the nasopharynx.

Diseases of the skin due to streptococcal infections. There is no specific treatment of recurrent erythema multiforme. In two cases which gave a strongly positive reaction to the hæmolytic streptococcus, intradermal vaccination with this organism was done in order to raise the resistance of the epidermal structures, including the skin and mucous membranes. In both cases improvement resulted.

A high proportion of positive reactions to streptococcus hæmolyticus was obtained in cases of lupus erythematosus, particularly that of the erythematous type, and in erythema multiforme, suggesting specific sensitization to this organism. Either the organism responsible for the eruption is a hæmolytic streptococcus or the state of sensitivity to the hæmo-

lytic streptococcus allows another factor to become active.

Apical infections of the teeth. All types of apical infection are primarily streptococcal, but no single causative organism can be determined by either aërobic or anaërobic methods. SAMUEL KAHN, M.D.

Calmette, A.: An Account of the Catastrophe of of Lubeck (Epilogue de la catastrophe de Lubeck). *Presse méd.*, Par., 1931, xxxi, 17.

The author reports the findings and recommendations of the committee that investigated the deaths at Lubeck which resulted from the accidental inoculation of infants with virulent tubercle bacilli. Of 251 infants inoculated with an emulsion supposed to be BCG, 72 died. Of this number, 5 died from causes other than tuberculosis. Autopsies on the remainder showed the presence of virulent tubercle bacilli which, in guinea-pigs, produced progressive lesions possessing all of the characteristics of virulent human tubercle bacilli and not those of BCG.

Two cultures which were found in the laboratory where the accidental contamination occurred were available for study. One showed that the supposed BCG emulsion contained virulent human tubercle bacilli. The other appeared to be pure BCG which was harmless on guinea-pig inoculation. The virulent human tubercle bacillus culture which was mixed with BCG was identified as coming from a laboratory where the strain was known to be weak and unstable. This probably accounted for the fact that some of the infants survived the injection.

There was no evidence to show that the BCG was capable of regaining or regained its initial characteristics of virulent bovine bacilli or that it could transform itself into virulent human bacilli.

Rigid isolation of laboratories preparing BCG is urged. The Committee stated that such laboratories should not be used for any other purposes. Neither should the glassware be used for general work. The animals employed should be housed where they cannot possibly be mistaken for others and where cross-infection cannot occur. W. P. VAN WAGENEN, M.D.

Zucchi, L.: A Case of Agranulocytosis (Su di un caso di agranulocitosi). *Riforma med.*, 1930, xlvii, 93.

Though agranulocytosis was first reported by Tuerk, it was first described completely under the name of agranulocytosis by Schultz in 1922. It is characterized by necrotic angina and leucopenia with complete or almost complete disappearance of the granulocytes. The white cells are almost all lymphocytes and monocytes, but there is no special change in their form and no great change in the red cells. The clinical symptoms are those of a severe infection with high fever. Death usually results in a few days. The chief histological finding is the absence of granulocytes in the bone marrow; there are only a few myeloblasts and myelocytes with signs of degeneration. Cultures yield no specific micro-organism, but sometimes show pneumococci, streptococci, and staphylococci. The treatment is

symptomatic and generally is not successful. Agranulocytosis is held by some to be a special form of sepsis caused by particularly virulent bacteria.

The author reports a case of the condition in a girl of fifteen years who was admitted to the hospital with severe angina and a high fever. The blood showed the typical picture of a very greatly reduced granulocyte count. The lymph glands were not enlarged. Quinine was administered, the mouth was washed out with hydrogen peroxide, and antidi-phtheria and anti-streptococcus serum were given. Recovery resulted.

The author concludes from this case that the blood disease is primary and the angina and sepsis are secondary. The granulocyte count was lowest at the beginning of the disease. When the general condition and the condition of the tonsils were most unfavorable the blood picture had begun to show improvement. Accordingly, there was a discrepancy between the blood picture and the general disease. The author states that agranulocytosis may occur also without angina and sepsis.

AUDREY G. MORGAN, M.D.

Roussy, G., and Oberling, C.: Epithelial Metaplasia and Its Relation to Tumors (La métaplasie épithéliale et ses rapports avec les tumeurs). *Ann. Surg.*, 1931, xciii, 90.

The occurrence of heterotopic tumors such as malpighian epitheliomata in the cylindrical mucosa has long been recognized. According to one of the two main hypotheses which have been advanced to explain it, the neoplasms are due to an embryonal malformation, whereas according to the other, they are the result of malpighian metaplasia of the cylindrical mucosa.

The possibility of malpighian metaplasia of the cylindrical mucosa having been proved beyond question, the second hypothesis is more generally accepted than the first at the present time. As the metaplasia itself seems to be dependent upon chronic inflammatory processes, a close relationship between the chronic irritative process, the metaplasia, and the tumor formation has been assumed. However, a study of the relation between chronic irritation and metaplasia on the one hand and between metaplasia and heterotopic tumors on the other reveals facts which weaken this theory.

First of all it is necessary to consider the circumstances and regions in which malpighian metaplasia of the cylindrical mucosa occurs. It is evident that the presence of a completely circumscribed malpighian island in the center of cylindrical mucosa does not constitute proof of a metaplastic process as it may be an embryonic malformation. Moreover, it is necessary in all cases to exclude immigration of malpighian epithelium from the neighboring regions.

Metaplastic phenomena are noted frequently in the respiratory tract. Even in children, subacute and chronic inflammatory processes are followed, sometimes surprisingly rapidly, by malpighian transformation of the bronchial epithelium.

Malpighian metaplasia is observed also in numerous cases of chronic thyroiditis. In the digestive tract it is confined practically to the salivary glands and the pancreas. In the salivary glands merely the ligation of an excretory duct or the injection of an irritating substance is sufficient to provoke malpighian transformation of the canalicular epithelium. In the pancreas, malpighian buds are observed very frequently in the excretory canals in the course of chronic pancreatitis. In subacute gonorrheal epididymitis and tuberculous epididymitis, the cylindrical epithelium of the epididymis often assumes a malpighian character. Except for tumor formation, the occurrence of malpighian metaplasia in the body of the uterus seems to be very rare. In the mammary gland, malpighian metaplasia of the milk ducts has been observed.

It is generally believed that this epithelial metaplasia is due, not to the structural transformation of adult cells, but to a proliferation of young cells; in other words, it is an atypical regeneration. As malpighian metaplasia is observed in only certain regions, chronic irritation cannot be the sole cause. Although chronic inflammatory processes are extremely frequent in the stomach and appendix, malpighian metaplasia has never been observed in these organs. The influence of a local factor is undeniable. Certain locations where malpighian metaplasia is very often observed rarely develop malpighian tumors. Therefore a metaplasia cannot be considered a precancerous lesion. In the thyroid gland, in which such a metaplasia is relatively frequent, malpighian cancers are very rare, and in the gall bladder, in which malpighian heterotopic epitheliomata are common, metaplastic processes are extremely rare. In the pancreas, metaplastic processes are frequent, but malpighian epitheliomata are rare. In the epididymis, metaplastic processes are very frequent, but malpighian epitheliomata are very rare. In the uterus the reverse is true.

These facts show that the interpretation of the epithelial metaplasia varies according to the organ. In the bronchi, pancreas, and epididymis, the metaplasia is by no means an indication of imminent cancerization, whereas in the uterus the presence of malpighian islands is frequently a sign of cancerization already present.

JOSEPH K. NARAT, M.D.

Du Bois, C.: Traumatism and Cancer (Traumatismes et cancers). *Rev. med. de la Suisse Rom.*, 1931, li, 65.

The author reports three cases in which a basal-cell growth developed at the site of trauma, and cites two of his previously reported cases in which, after trauma, a foreign body was found in a basal-cell growth. The patients ranged in age from ten to seventy-nine years. In no instance was the tumor preceded by chronic irritation of the skin. Du Bois states that a predisposing cause of cancer can exist in active young skin as well as in regressive senile skin. Photomicrographs suggest the sebaceous glands as the sites of the neoplastic change. In the

child, as in the adult, epithelioma occurs most frequently on the face.

In cases of cancer following trauma, the patient's story of trauma should often be discounted, but in the author's cases the relation between the injury and the formation of the neoplasm was intimate. The period between the injury and the appearance of the growth ranged from four to six months.

The first of the author's recent cases was that of a boy ten years of age who cut his forehead in a fall. The wound healed without a scar in ten days. A tumor proved histologically to be a basal-cell neoplasm appeared at the site of the trauma five months later.

The second case was that of a man who lacerated his face in a fall. In this case also the wound healed without a scar. Six months later a neoplasm appeared and after growing for two years reached a resting stage. At the end of the third year the tumor began to enlarge and was excised. A photomicrograph showed an old and a new area of activity. The older area was surrounded by a fibrous capsule. The dual structure is evidence of a plurifocal origin of basal-cell tumors.

In both of these cases the sebaceous glands were the site of change and the epidermis was raised by basal-cell and fibrous tissue proliferation.

In the third case, that of a man seventy-nine years of age, the history was similar and histological examination showed the tumor to be a mixed epithelioma.

Of the two previously reported cases, one was that of a man sixty-five years of age who was struck on the face by an insect. A few months later a growth appeared at the site of the injury and grew slowly for five years. Microscopic examination showed the tumor to be a basal-cell neoplasm about a chitinous foreign body or insect appendage.

The other case previously reported was a case of basal-cell tumor with a giant-cell reaction about a caterpillar hair.

The author suggests that in the first three cases the trauma may have introduced an invisible foreign body, and that trauma plus a foreign body may be a predisposing cause of cancer. Trauma may prepare the cells for growth when a neoplastic tendency is already present, it may bathe the surviving cells with broken-down protein products, or it may create a physical difference in the electrical potential between intact cells and broken cellular elements.

CURTIS NELSON, M.D.

12 a - Jan.

Guillaumin, C. O.: The Diagnosis of Endocrine Dysfunction and Cancer by Examination of the Blood with the Interferometric Technique of Hirsch (Diagnostic des états dysendocriniens et du cancer par l'examen du sang selon la technique interférométrique de Hirsch). *Presse méd.*, Par., 1930, xxxix, 34.

This article is based on Abderhalden's theory that certain complex substances, including carbohydrates

as well as protein derivatives, will stimulate the formation of defense ferments in the blood. The stimulation of a defense ferment by a tissue agent should not be confused with an antigen-antibody reaction which is produced only by proteins which are soluble.

The discarded methods of determining these serum ferments are briefly reviewed by the author. They include dialysis with or without the ninhydrin reaction, polarimetry, immersion refraction, and bacillus coli fermentation of amino acids combined with Ehrlich's indol test.

The author describes the Hirsch interferometer, an instrument which measures the breakdown of a tissue by a serum ferment. The index of refraction is measured from the fringes of interference. The patient's serum treated with a known tissue agent is compared in the interferometer with his untreated serum.

In the preparation of the known tissue agents, diseased tissues removed at operation or normal tissues removed during repair after trauma are washed free from blood, albumin, soluble salts, and lipoids. As connective tissue is a cause of error, especially in neoplasms and placental tissue, this also is removed. The specimens are then ground up and divided among numerous sterile tubes. If any of these agents are affected by a serum heated to 62 degrees C., they are affected by some factor other than a ferment and are discarded.

The patient's serum is separated from the patient's corpuscles with precautions for sepsis. The serum is then added to the tissue agent, mixed with a quinine preparation, vuzine, which acts as a preservative, and allowed to stand for twenty hours at 37 degrees C. It is then cooled and centrifugalized and compared in the interferometer with some of the patient's untreated serum.

The diagnosis made by this method was correct in 94 per cent of cases of ulcers or neoplasms of the stomach, duodenum, and large bowel, and in 64 per cent of cases of uterine lesions.

Endocrine dysfunction is associated with ferment changes. The test has shown suggestive results in hyperthyroidism, obesity, arthritis deformans, and certain suprarenal disturbances.

CURTIS NELSON, M.D.

DUCTLESS GLANDS

Ceccarelli, G.: The Problem of Regeneration: The Influence of the Endocrine System on the Regeneration of Skin and Bone (Sul problema della rigenerazione: influenza del sistema endocrino nella rigenerazione della pelle e delle ossa). *Arch. ital. di chir.*, 1930, xvii, 641.

Although much is known of the morphological changes which take place in tissue regeneration, the factors which initiate, maintain, and conclude the process are not completely understood. The author gives an extensive review of the literature on this subject.

Following a review of the normal process of regeneration of the integument and bone, Ceccarelli reports the results of a series of experiments undertaken to determine the influence of certain hormones and extracts of glands of internal secretion on the repair of these tissues in the rabbit. The experiments dealt with only one phase of such influence, namely, the direct application of the extracts to the zone of repair.

In the studies of the repair of the skin it was found that testicular extract definitely accelerated the repair. The acceleration was most marked during the first week. A wound treated with this extract healed three days sooner than the normal control. Thyroid extract and insulin shortened the repair period by two days. The same extracts shortened the repair time also in animals in which the reticulo-endothelial system was blocked.

Bone repair was studied with special reference to fractures and subperiosteal resection. Glandular extract was injected on alternate days into a lesion in one leg, and the same amount of physiological solution was injected into the control leg. The animals were sacrificed after periods ranging from fifteen to sixty days and studied in these stages roentgenographically and histologically.

Thymus and hypophyseal extract accelerated the healing of the fractures so that a distinct difference between the treated and control lesion was noted both roentgenographically and histologically within fifteen days. In the repair after subperiosteal resection they acted similarly. These extracts definitely activated the regeneration of bone throughout all periods of repair and caused precocious development of the medullary canal. Thyroid extract acted in a similar manner to a less degree.

PETER A. ROSI, M.D.

Okie, M.: Tar Cancer and Endocrine Function.
Japanese J. Obst. & Gynec., 1930, xlii, 622.

The development of tar cancer in rabbits requires a certain degree of normality in all of the endocrine glands and the principal visceral organs. When intoxication and the degree of invasion into the tis-

suces are intense, deterioration occurs in the general metabolism and nutrition. The process of epithelial hypertrophy is then obstructed and epithelial cancer does not develop.

The development of tar cancer in rabbits requires epithelial hypertrophy as a precursor. When epithelial hypertrophy is absent, cancer does not develop.

Painting the skin of a rabbit locally with tar appears to favor a disposition to hypertrophy on the part of the general epithelial system as a vital defensive reaction to the absorption of the tar and its transmission through the body.

The epithelial hyperplasia following the application of tar is apparently due to some endocrine influence. When the hypertrophied epithelium is stimulated secondarily by the tar it may develop a true cancer.

The thyroid gland shows chiefly hypertrophy (hyperfunction). This seems to have some relation to the epithelial hypertrophy of skin painted with tar.

In rabbits in which tar cancer develops and epithelial hypertrophy occurs, hyperplasia (hyperfunction) of the suprarenal cortex is often found. In the absence of epithelial hypertrophy, hyperplasia of the suprarenal cortex is absent or the cortex undergoes atrophy. The hyperplasia of the suprarenal cortex and the thyroid hyperfunction appear to have some relation to epithelial hypertrophy.

Rabbits painted with tar always show a slight inhibition in the development of the ovarian follicles and a tendency of the interstitial glands to undergo atrophy (deterioration of function).

In the cases of rabbits in which ovarian transplantation has been performed, painting with tar produces hyperfunction first of the genital glands and then of the suprarenal cortex and the thyroid gland. Next, it causes deterioration of function in the ovaries and thyroid, and finally hyperfunction or deterioration in the suprarenal cortex. For the time being, a change takes place in the endocrine function which stimulates the process of epithelial hypertrophy, probably thus favoring the development of true cancer.

JOHN H. GARLOCK, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

SURGERY OF THE HEAD AND NECK

Head

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INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Moral, H., and Schlammpp, H.: Fractures of the Jaws (Kieferbrueche). *Fortschr. d. Zahnh.*, 1930, vi, 973.

There is considerable difference of opinion as to whether fractures of the jaws should be treated by blocking, immobilization, or functional methods. The interference with the bite has been generally neglected. The authors recommend functional treatment. They state that in fresh fractures immediate reduction should be attempted if it can be done without undue force. Sometimes impactions render reduction impossible so that splinting cannot be done until after surgical treatment.

For splinting, the precious metals are more practical and economical than the common metals because the former can be adapted more easily and can always be used again. Recently, rustless steel has been recommended. This is used also for bone sutures. However, in fractures of the jaws it is employed infrequently as it favors fistula formation. It is used only for band sutures in uncomplicated fractures of edentulous jaws, fractures of the ascending ramus, and oblique fractures.

In recent years, condylar fractures have been seen more frequently. The apparent increase in their incidence may be due to more accurate diagnosis. In the treatment of these fractures the chief factor to be considered is the relation of the line of fracture to the musculature. The fractures are of the following types: (1) fractures internal to the muscles which open the jaw, (2) fractures between the muscles which open and those which close the jaw, (3) fractures internal to the muscles closing the jaw, i.e., in the horizontal ramus up to the angle of the jaw, (4) fractures in the ascending ramus up to the sigmoid incisura, and (5) fractures behind the muscles which close the jaw, in the region of the condylar process.

Stereoscopic roentgenograms are of great aid in the diagnosis. Fractures which at first seem double

may be found to be oblique. Double fractures are quite rare. Their recognition is very important from the standpoint of treatment.

Whether or not the broken-off fragments in condylar fractures should be removed is best answered by considering the blood supply of the condyles. Even for such fractures functional treatment seems to be more practical than immobilization and to be followed less frequently by ankylosis. In edentulous jaws perfect reduction is less important as the dentures may be fashioned as desired.

The so-called Strassburg splint with the inclined planes does not seem to be practical as it requires additional elastic traction which in itself is sufficient. A double splint in the form of a spring denture in which the plates are pressed against the jaws by the spring has been recommended. In this splint also oblique planes are employed.

From attempts to accelerate the formation of callus by medication, the authors conclude that the administration of *vigantol* when the diet is rich in calcium and vitamins is superfluous and under certain conditions may be harmful. Phosphorus seems to have a favorable effect. The use of *nateina*, which consists of Vitamins A, B, C, and D and 20 cgm. of calcium phosphate, is recommended. Injections of autogenous blood and weak roentgen irradiation are beneficial.

BRAUN (Z).

Axhausen, G.: Resection, Plastic, and Prosthesis of the Jaw (Kieferresektion, -plastik und -prothese). *Fortschr. d. Zahnheilk.*, 1930, vi, 917.

In recent years it has been generally agreed by oral surgeons that after resection of the lower jaw prosthetic covering of the defect is to be preferred to autoplasmic covering only under special conditions (danger of recurrence, advanced age), and that after resection of the upper jaw only prosthetic replacement should be considered. The general opinion that with prosthetic replacement of the articular portion the joint pocket gradually becomes epithelialized has been disproved by a case studied by Sudeck and

Rieder in which epithelization failed to occur in a period of eighteen years. According to Sudeck and Rieder, epithelization never occurs.

Ollier maintained that freshly transplanted autogenous bone covered with periosteum remains alive in all its parts. Barth concluded that the transplant undergoes an aseptic necrosis in all its parts (periosteum, bone, and marrow) and is permeated and entirely replaced by newly formed living bone. In Axhausen's opinion, essential parts of the transplanted marrow and periosteum remain alive and become points of origin of new bone tissue which grows around the dying bone and is gradually substituted for the latter. As soon as the transplanted bone is surrounded on all sides by a layer of new bone, it is protected against infection and the foreign body character of the dead bone is thereby eliminated. In the periosteum only the cells of the cambium layer immediately next to the bone have the power of proliferation and bone formation. Only when blood vessels and the juices of the bed can penetrate to them quickly do they develop their bone-forming property. It is therefore advisable to open the way to the cambium layer by incisions into the periosteum of the bony bridge. It is advisable also to leave the bone marrow attached to the transplant as new bone formation begins rapidly from marrow. For the same reason the transplantation of bisected tubular bones is preferable to the transplantation of closed bones.

The two-stage resection of the jaw (the first stage includes resection and maintenance of the position of the jaw, and the second stage, correction of the defect after the healing of the wound) has the disadvantages of a long period of healing and the danger of latent infection. These disadvantages may be lessened by: (1) the formation of a pedicle of the soft parts of the bony transplant (the displacement plastic of Pichler), a procedure that is quite difficult and not always possible in cases of tumor, and (2) Axhausen's preliminary transplantation. The latter procedure is carried out as follows:

In a preliminary operation, the transplant is laid under the skin at the site of the subsequent continuity resection through a small incision. In from four to six weeks it is surrounded by a mantle of newly formed living bone which protects it from infection and consequent sequestration. The next stage of the operation consists of resection and insertion into the defect of the previously transplanted piece of bone hanging on its pedicle of skin and its fixation to the stumps by wire sutures. A drain is placed in the lower angle of the wound.

Healing occurred in all of seven cases in which Axhausen performed this operation. In one case of erysipelas, in which the operative field was also infected, there was complete sequestration of the implanted rib, but as this was covered by periosteum on one side and had been surrounded there by new bone in the preliminary stage of the transplantation, the result of the plastic was nevertheless excellent. Therefore in this very unfavorable case a good result

from the plastic operation was made possible by the preliminary transplantation.

In cases of malignant tumors preliminary transplantation should not be done. The two-stage operation is the procedure of choice.

In cases of central giant-cell sarcoma and adamantinoma the resection should be made in healthy tissue as these neoplasms border on malignancy.

In the author's opinion, preliminary ligation of the carotid artery is not necessary. JASTRAM (Z).

EYE

Gastroviejo, R.: The Pathology of Chronic Simple Glaucoma. *Arch. Ophthalmol.*, 1931, v, 189.

In chronic simple glaucoma the whole organism presents a generalized angiosclerosis and all of the intra-ocular vessels present atheromatous degeneration. Other manifestations are hyaline degeneration, lipid infiltration, and pigment degeneration. There is a nervous-endocrine-humoral circle with a progressive decrease in the metabolic exchanges or nutrition. The relation between these three factors is not known. The osmotic equilibrium between the blood pressure and intra-ocular fluids is altered, the nutrition of the vitreous body and lens is changed, and a state of turgescence is produced which pushes the iris forward, narrowing the anterior chamber. In a myopic eye, in which the insertion of the iris is high on the ciliary body and distant from the spaces of Fontana and there is accommodation for near work, the ciliary muscle is functionless and atrophies. As the ciliary body is situated in front of the insertion of the iris and far from the cornea, the anterior chamber is very deep. On account of the weakness of the ciliary muscle, the deep anterior chamber, and the fact that the excursion of the iris, which depends on the expansion of the vitreous and lens, must be more extensive than normal to occlude the iridocorneal angle, such an eye is not predisposed to glaucoma. In the hypermetropic eye the anterior chamber is shallow as the insertion of the iris is much nearer the spaces of Fontana, and the circular fibers of the ciliary muscle, located behind this insertion, push the iris forward in contracting, tend to occlude the iridocorneal angle, and, aided by the pressure of the engorged lens, the vitreous, and the larger adult lens, predispose to glaucoma.

In advanced sclerosis the altered capillary walls permit the escape of serum and blood. Hemorrhagic glaucoma of this type is only an advanced degree of chronic simple glaucoma. The interchange between the blood plasma and tissue becomes progressively less. Toxic substances accumulate in the tissues, the lens undergoes the changes of senility as the result of poor nutrition, and intra-ocular edema becomes established. Finally, by the combined action of the engorged vitreous and lens already increased in size by age, a predisposition due to anatomical conditions, contraction of the ciliary body pushing the lens forward, the thickened aqueous humor, and the generalized sclerosis of the tissues,

the periphery of the iris is pressed against the spaces of Fontana and glaucoma is established.

LESLIE L. MCCOY, M.D.

Diggle, F. H.: Intranasal Dacryocystostomy for the Relief of Lachrymal Obstruction. *Brit. M. J.*, 1931, i, 391.

The author gives a short résumé of the history of operation on the lachrymal sac, describes the West technique, and discusses the results, indications, and contra-indications of the operation. In the cases reviewed, 73 per cent of the patients were completely cured, being free from epiphora even when they were out of doors.

THOMAS D. ALLEN, M.D.

Raia, V. L.: A Case of Heterochromia Iridis. *Am. J. Ophth.*, 1931, xiv, 299.

In the case of a man twenty-nine years of age, acute mastoiditis on the left side was followed by chronic iridocyclitis of the right eye and, two years later, by heterochromia iridis. A second attack of mastoid infection on the left side four years after the first attack was followed by chronic uveitis of the left eye and, within a month, by depigmentation which has continued steadily. There has been no other indication of a change in the cervical sympathetic. Keratitis punctata has never been noted, and vision has remained 20/20 in each eye. The dust-like vitreous opacities have shown marked improvement.

SAMUEL A. DURR, M.D.

Lancaster, W. B.: The Cataract Operation. *Surg., Gynec. & Obst.*, 1931, lii, 452.

The author describes his technique for the cataract operation in detail and gives his reasons for adopting various maneuvers. He advocates double fixation of the eyeball by means of forceps and a stitch through the superior rectus.

With regard to anesthesia, Lancaster says that his aim is to secure a patient who "cannot feel, does not want to move, and could not move if he tried." Large amounts of barbital, sodium amytal, and codeine or hyoscine are employed for basal anesthesia and are continued for several days following the operation if there are no contra-indications. The author has never regretted using so much basal anesthesia and occasionally has wished that he had used more. Four per cent cocaine is instilled and 1 per cent cocaine with adrenalin is injected above and below the limbus, but not close to it. Ciliary injection and akinesia are rarely regarded as necessary, but novocain is sometimes injected to render the lids insensible.

A large corneal section is made parallel with the iris and behind the limbus. A conjunctival flap up to 5 mm. wide is formed. A suture is seldom used as a good flap becomes adherent in a few hours. Intracapsular extraction is done by simultaneous external pressure below the limbus and traction with the capsule forceps to dislocate the lens. The assistant may aid the passage of the lens through the pupil by gently retracting the iris with a small hook or

rotating the presenting lens with a cystotome. Following extraction, a buttonhole iridectomy is done. In most cases the sphincter is left intact, but sometimes incision of the sphincter is necessary for passage of the lens.

SAMUEL A. DURR, M.D.

Nakajima, M.: Examination of the Fundus of the Eye with Red-Free Light (Beitrag zur Untersuchung des Augenhintergrundes im rotfreien Lichte). *Keijo J. Med.*, 1930, i, 29.

If the fundus of the human eye is to be seen in its natural color, sunlight must be used for ophthalmoscopy. The useful rays in ophthalmoscopy are those which are reflected at the surfaces of the retina and sclera and then emerge from the pupil. The emerging rays may be divided into two main groups: (1) the retinal rays, which are reflected from the surface of the retina and emerge through the pupil, and (2) the choroidal rays, which are reflected from the choroid and the surface of the sclera and through the pupil. In the observation of the fundus it was found that these two kinds of rays interfere with each other.

To eliminate the choroidal rays and thereby render the retinal picture more distinct, the author uses an apparatus in which the filament of the lamp coincides with the anterior focal point of the collecting lens at such a point that the light rays radiating from the source of light run parallel after they pass through this lens. The rays are then passed through two water boxes and are brought together again by a second collecting lens. The lens is arranged so that its posterior focal point coincides with the source of light of Thorner's ophthalmoscope and in ophthalmoscopy this point appears in the red-free light like a second source of light. The first lens is a biconvex lens of 13 D, and the second a lens of 20 D. Recently this apparatus was improved by the insertion of a concave lens behind the source of light so that the focal point of the lens and the filament of the anterior focal point of the lens coincide. This apparatus makes possible great conservation of the intensity of the light.

The advantages of the use of red-free light are summarized as follows:

1. The macula lutea appears yellow and has a peculiar color tone which varies according to the disease process present. This is of advantage when the localization of the macula is not demonstrable with ordinary light, as in the mosaically arranged fundus in severe myopia, severe chorioretinal atrophy, and degeneration of the macula of various types. In these conditions the macula always shows a definite yellow coloration which is in sharp contrast to the diffuse bluish-green fundus.

2. The appearance and disappearance of the nerve fiber markings and the appearance of the so-called "marbling" at the site of the vanished fiber markings, especially at the papillomacular bundle, are indispensable in the diagnosis of the various diseases of the optic nerve, and especially for the definite diagnosis of axial neuritis (beriberi).

3. An exudate of blood appears as a black spot and therefore cannot be overlooked, no matter how small it may be.

4. The superficial retinal light reflexes are evident in great abundance because even very slight elevations appear as irregular reflections on the surface of the retina. This fact is important in the diagnosis of the early changes in the retinal surface in axial neuritis and central retinitis. Of special importance is the appearance of the superficial abnormal irregular reflections in the papillomacular zone. These constitute an early sign of axial neuritis in beriberi.

5. The relationships of depth in the fundus pictures are much more distinct than with ordinary light. This is the case, for example, in ordematous protrusion of the macular retina in the initial stage of central retinitis.

6. The parallax phenomenon of the foveola reflection is also much more distinct than with ordinary light. In pathological conditions it is of importance to determine the tardiness or the complete disappearance of this phenomenon.

Red-free light is indispensable in the examination of the ocular fundus when a very accurate diagnosis of the fundal disease is essential. It is particularly well suited for examination of the macula-yellow, the nerve fiber markings, and the changes in the superficial retinal reflections. These changes, which cannot be readily seen in ophthalmoscopy with ordinary light, are the most important clinical characteristics of retinal and optic nerve diseases.

LOUIS NEUWELT, M.D.

EAR

Alden, A. M., and DeMotte, J. A.: The Value of the Schilling Haemogram in the Otological Infections. *Ann. Otol., Rhinol., and Laryngol.*, 1931, 41, 95

The investigation herewith reported was undertaken primarily to evaluate the haemogram as a possible diagnostic and prognostic aid in cases of acute otitis media and mastoiditis. The haemogram is based on the Arneth and Schilling classification of polymorphonuclear leucocytes according to which the "nuclear deviation" is an indication of the underlying pathological process. To interpret the haemogram it is necessary to be familiar with this classification, to understand what is meant by "nuclear deviation" and "stab cells," and to have a thorough knowledge of the various blood elements. Briefly stated, the chief essential is the relative percentages of the multinucleated polymorphonuclear leucocytes, which vary according to their age and length of time present in the peripheral blood stream.

In the investigation which was reported a very careful technical procedure was carried out and daily blood studies were made at or about the same time of day in order to obviate the error which occurs in various physiological states and to obtain a control.

Nine cases of suppurative otitis media, some of them with such complications as lateral sinus thrombosis and meningitis, were studied.

The authors conclude that the stab-cell count is a much more reliable index of the patient's condition than the percentage of polymorphonuclears in the total number of white blood cells and, in children, is of more importance than the pulse and temperature variations. When the so-called stab cells increase in number on daily examination, operative interference is indicated.

In conclusion the authors state that while the haemogram must be considered a distinct advance in the interpretation of various blood findings, it cannot be expected to differentiate accurately between such closely allied conditions as acute suppurative otitis media and acute suppurative mastoiditis.

JOHN F. DELPH, M.D.

Bernštejn, S.: Plaut-Vincent Flora in the Pathology of the Ear. Fusospirochetalis of the External Auditory Canal (Plaut-Vincent Flora in der Pathologie des Ohres. Fusospirochetalis des äusseren Gehörganges). *Otiatrii*, 1930, v, 236.

After a review of the literature, from which it appears that external otitis of Plaut-Vincent origin is exceedingly rare (only four cases having been reported in the entire literature to date), the author reports a case coming under his observation.

The patient, a seven-year-old girl with chronic bilateral suppurative otitis media, exhibited on the posterosuperior wall of the external auditory meatus a 15 mm. ulcer which was covered by a dirty grayish-yellow crust. The Plaut-Vincent flora was found, but neither the spirocheta refringens nor the bacillus fusiformis was present in the mouth or the throat or the pus from the ear. After treatment with boric acid and silver nitrate for two weeks the ulcer and the Plaut-Vincent flora disappeared. When a recurrence developed two months later the Plaut-Vincent symbiosis was found in the pus from the middle ear. Treatment by the intravenous injection of neosalvarsan resulted in complete cure.

BELINOFF (H).

Profant, H. J.: Gradenigo's Syndrome, with a Consideration of "Petrositis." *Arch. Otolaryngol.*, 1931, xiii, 347.

Pneumatic cells are present in the petrous bone more frequently than is generally believed. Two rows of cells extending to the petrous tip are described: (1) the antrum-epitympanic, and (2) the hypotympanic. As the cells can always be traced anatomically to one of these rows, they develop embryologically in this manner, and infection may extend from the hypotympanic space as well as from the antrum-epitympanic space. It is possible also that infection may enter either row near the orifice of the eustachian tube before, or even without, entering the tympanum. For involvement of the pneumatic cells of the petrous bone by infection the author suggests the term "petrositis."

Petrositis may be present without obvious clinical signs. One sign suggestive of the condition is the presence, and especially the recurrence, of a profuse aural discharge in the absence of definite involvement of the mastoid or during postoperative care after mastoidectomy. The first definite sign is pain in the areas supplied by the trigeminal nerve, most commonly the temporoparietal region.

The complications of petrositis depend upon the type and degree of the pneumatization, the virulence of the infection, and the patient's resistance.

In the majority of cases Gradenigo's syndrome is a complication of petrositis. In others it is due to complications of middle ear disease, such as mastoiditis, sinus thrombosis, extradural abscess, or abscess of the brain.

Some patients with petrositis recover after myringotomy, and the majority after simple mastoidectomy with special attention to the cells about the antrum and zygoma. The radical procedure of exploring the petrous tip is rarely indicated.

JAMES C. BRASWELL, M.D.

Ueda, H.: *Experimental Investigations on Concussion of the Labyrinth in Head Injuries* (Experimentelle Untersuchungen ueber die Labyrintherschuetterung bei Kopfverletzungen). *Keijo J. Med.*, 1930, i, 87.

In clinical and histological studies of the auditory organs of guinea-pigs after head injuries, the author demonstrated various pathological changes which developed in different ways according to the degree of the external force. The clinical observations were the Preyer reaction, spontaneous nystagmus, nystagmus following turning of the head, and disturbances of balance.

When the force was slight, the Preyer reaction showed no abnormality, but when the force was severe there was always a more or less marked decrease in the auricular reflex. When the force was extremely severe, there was always complete disappearance of the reflex. A decrease in the reflex was followed by: (1) permanent hypo-excitability, (2) slow recovery, or (3) recurrent weakening even after previous improvement. These results agreed with the histological findings in the ear. With regard to the animals showing permanent hypo-excitability it may be assumed that various parts of the labyrinth eventually underwent degenerative atrophy as the result of the head trauma. In the animals showing slow recovery, slow improvement was demonstrable also by the histological findings. In the animals showing recurrent weakening, suppuration in the middle ear or the labyrinth was usually demonstrable on histological examination. The various parts of the labyrinth, which are severely damaged by direct injury or as the result of circulatory disturbances, are easily affected by a secondary suppurative infection.

After the injury to the head, spontaneous nystagmus was often observed on the other side. Sometimes it ceased, but on exertion it recurred in a more

active form, though it usually disappeared again the next day. The findings indicated that this spontaneous nystagmus resulted when the labyrinth was injured directly; when a profuse hæmorrhage occurred into it, causing a sudden marked increase in the internal pressure; and when the endolymph escaped externally through a rupture of the membranes of the fenestra rotunda or ovalis or the labyrinthine capsule. It is possible also that there was a simultaneous injury to the centers of the eighth nerve even without a noticeable change in the static labyrinth. Not infrequently, such an attack of nystagmus was brought on again by a change in the posture of the body. Apparently this occurred when the larger part of a cupula became separated from the crista, and when, following rupture of Reissner's membrane, a flow of endolymph occurred with the movement of the blood mass.

When the force was moderate or strong, a decrease or an increase of the nystagmus which followed turning of the head was often noted on one or both sides. When there was abnormal excitability of this form of nystagmus, distinct histological changes in the ear on the same side were always recognizable. These could be found definitely in the static apparatus. They were more marked in hypo-excitability than in hyperexcitability. When there was a unilateral or bilateral decrease of the nystagmus which followed turning of the head the prognosis was usually grave, but when a state of excitation persisted, the prognosis was more favorable. Changes in the static organs were always found. An abnormal variation of the nystagmus which occurred after turning may sometimes be associated with panotitis.

Nearly all of the animals exhibited more or less marked disturbances of balance. When the injury was slight, these disturbances were usually transient, but when the injury was severe they persisted for a long time although eventually they ceased. When they persisted for some time, pathological changes in the macula, the cristæ acusticæ, or the entire labyrinth were often observed. Disturbances of balance were associated also with lesions of the central region.

When the force was severe, there was always a comminuted fracture of the skull at the site of the injury, and sometimes there was a tear of the brain substance. Hæmorrhages at the base of the skull were invariably present. Large hæmatomata formed in the subcutaneous and periosteal tissues. More or less bleeding always occurred in the subdural space. Bleeding was found also in the ventricles and about the cerebellum and the medulla oblongata, but after a few weeks it was resorbed and callus formation took place in the fracture regions. In the tissues stained intravitaly it was no longer demonstrable from fifty to seventy days after the injury. When the force was moderate, a few ruptures sometimes appeared in the skull. When the force was slight, there were no fractures or ruptures in the skull. When a strong or medium force was applied to the

base of the skull a longitudinal fracture of the pyramid was found not infrequently. Transverse fractures were rare.

The external auditory canal was usually unharmed, but when fixation of the tissues was done immediately after the trauma engorged blood vessels were sometimes observed in the canal lining and the handle of the malleus. The drum membrane was generally tense, but when the force had been powerful it occasionally showed rupture or relaxation. Rupture usually occurred in the posterior and lower part. Rupture of the drum was sometimes observed in cases with fracture of the base of the skull.

When fixation of the tissues was done immediately after the injury there was always more or less extravasation of blood or a mass of serous exudate in the tympanic cavity. Blood extravasation or serous infiltration usually appeared in the submucous tissue, and in some instances separation of the mucosa was found, but these changes usually retrogressed in time. Signs of inflammation of the middle ear sometimes followed when the drum was ruptured. The bony part of the middle ear was generally intact, but occasionally a longitudinal fracture of the temporal bone running through the tegmen tympani occurred.

The petrous bone showed three types of fracture: (1) a longitudinal fracture, which occurred most frequently when the force was directed to the temporal and parietal bones, ran parallel with the anterior border of the pyramid, and usually extended through the roof of the tube and the middle ear, (2) a transverse fracture, which occurred usually when the force was directed against the base of the skull, and (3) avulsion of the tip of the petrous bone, which was generally combined with a longitudinal fracture.

The auditory ossicles and auditory muscles usually showed no marked change. Fractures of the neck of the malleus and the crura of the stapes were rare. Isolated blood cells were sometimes found in the facial nerve canal, while the nerve fibers themselves showed no pathological changes. The eustachian canal presented nothing abnormal except occasionally slight desquamation and a few blood cells or masses of serous exudate. In the fenestra ovalis, blood extravasation or exudate were found. The stapedio-vestibular junction rarely showed subluxation. In the fenestra rotunda a few isolated blood cells and masses of serous exudate were usually observed. When the force had been severe or moderately severe, the membrane itself was relaxed or showed wave-like relaxation, but was rarely ruptured.

The bony part of the cochlea usually remained intact, but when the force had been severe the bony labyrinth capsule was sometimes ruptured as the result of a transverse fracture. It was under such circumstances that the pronounced pathological changes in the membranous labyrinth were found. When a transverse fracture had occurred there was usually total deafness or loss of the vestibular

function. In rare instances suppurative meningitis resulted from secondary infection.

In almost every animal there was more or less change in the perilymphatic space, frequently in the form of exudates or hemorrhages. Such exudates often occurred in considerable amounts in the cochlea, especially the scala vestibuli, in the vicinity of the fenestra rotunda membrane in the scala tympani, and in the perilymphatic space of the vestibule. They occurred in the endolymphatic space only rarely, even after a severe blow. The author attributes them to circulatory disturbances. Hemorrhages were rarely observed in the perilymphatic space of the vestibule or the semicircular canals. The hemorrhages or exudates occurring in the labyrinth sometimes persisted for many months after the trauma without becoming resorbed or organized and without producing microscopically demonstrable changes in the sensory epithelium, even though the Freyer reaction returned to normal. The old hemorrhage did not disturb hearing. Nearly always, the tissues of the perilymphatic space of the static labyrinth showed more or less rupture. This rupture, in association with the change in the endolymphatic sacculus and the aqueductus vestibuli, plays an important part in the occurrence of concussion of the labyrinth. The vestibular sacculus was injured especially at the utricle. The upper and horizontal semicircular canals showed more marked changes than the posterior canal. The aqueductus vestibuli frequently presented initial edema of its wall lining, but in the later stages it became atrophied and its lumen was dilated. The aqueductus cochlear was affected less than the aqueductus vestibuli. This fact and the changes in the perilymphatic space indicate that concussion of the lymph plays an important part in the occurrence of concussion of the labyrinth.

Suppurative otitis media often followed the injury to the head, making the prognosis grave. The infected middle ear contents sometimes perforated into the inner ear through the fenestra ovalis or rotunda, with or without rupture of the fenestral membranes.

The internal auditory canal and the modiolus often showed vascular dilatation and even slight hemorrhages. These changes were due to the circulatory disturbances caused by a sudden compression pressure on the brain and the direct molecular oscillation through the bone substance, but always retrogressed to normal with cessation of the circulatory disturbance.

More or less marked pathological changes of a similar nature were usually found also in Reissner's membrane, the basal membrane, and the organ of Corti. They were generally more pronounced in the upper coils. In the basal coil the molecular oscillation seemed to be the more important factor, whereas in the upper coils concussion of the lymph was more active.

The pathological changes in the organ of Corti varied according to the severity of the force. Tissues

that were fixed a few days after the injury showed the lesion more distinctly than those that were stained intravitaly. After severe and moderately severe force the tissues returned to normal if the changes were relatively slight, but degenerative atrophy resulted when the changes were marked.

The pathological changes in the supporting tissue (Deiter's cells, Hensen's cells, Claudius' cells, epithelial cells of the internal and external sulcus spiralis, stria vascularis, and ligamentum spirale) were generally identical with those in the sensory cells.

The static organs presented similar findings, viz., degenerative changes and atrophy.

The degenerative changes in the nervous elements were more pronounced the longer the animal survived the trauma. The changes in the ganglion cells were practically the same as those in the sensory cells of the organ of Corti. The same may be said of the nerve fibers and the nervous elements in the static organs.

Brunner has divided the clinical manifestations in the ear following traumatic injury of the head into: (1) those associated with concussion of the brain, (2) those associated with concussion of the brain and the internal ear, and (3) those associated with fracture of the petrous bone. Those of the first group can be attributed chiefly to changes in the central region of the eighth nerve. Those of the second group include symptoms due to changes in the region of the membranous internal ear in addition to those referable to the nuclei. Those of the third group are dependent on fracture of the bony inner ear capsule. Each of the three groups of cases presenting these symptoms includes mild cases and cases which terminate fatally immediately after the injury. Also in each of the three groups death may result from a secondary infection of the middle ear and from meningitis. In cases of the first and second groups there is relatively often a longitudinal fissure through the roof of the middle ear and the antrum which favors the development of meningitis.

The author draws the following conclusions:

1. Concussion of the labyrinth in injury to the head is produced partly by the molecular motion of the labyrinthine capsule and the effect of the forceful impact of the labyrinth lymph and partly by the circulatory disturbances which are caused by both factors.

2. Different morphological changes appear in the labyrinth.

3. When the tissues are fixed immediately, the changes found in the internal ear are chiefly hemorrhages. The changes in the nervous elements and their end-organs are less prominent.

4. When the tissues are fixed some time after the injury, the labyrinth shows, not only blood extravasation, but also changes in the nervous elements and their end-organs.

5. The associated pathological changes in the internal ear vary, and are always more pronounced in the cochlea than in the static labyrinth.

6. The histological changes in the cochlear apparatus are most prominent in the apical coil.

7. The pathological changes in the nervous elements and their end-organs always appear simultaneously.

8. In cases in which the turning reaction is completely lost or is reduced, the pathological changes in the labyrinth are generally marked.

9. After a period of time, the histopathological changes in the labyrinth show improvement if no suppurative complication develops.

10. When there is a transverse fracture of the base of the skull the pathological changes in the labyrinth are much more pronounced and as a rule no improvement in these changes can be expected.

11. For a very long time the hemorrhages occurring in the labyrinth are neither resorbed nor organized.

12. It appears that the collection of blood in the perilymphatic space of the cochlea produces no secondary alteration in the organ of Corti.

13. The old collection of blood in the perilymphatic space of the cochlea does not weaken the Preyer reaction. In most cases in which no noteworthy pathological change is observed in the nerve elements or their end-organs in spite of a large collection of blood in the perilymphatic space, the excitability of the auricular reflex is found to be normal.

LOUIS NEUWELT, M.D.

McKenzie, D.: *The Pathogeny of Aural Cholesteatoma*. *J. Laryngol. & Otol.*, 1931, xvi, 163.

The author rejects the theory that cholesteatoma has its origin in suppurative of the middle ear. In his studies of the condition he found that many of the clinical phenomena are best explained by the assumption that the cholesteatoma is always primary.

The epidermoid theory appears to him to be more logical because it brings aural cholesteatoma into close relationship to cerebrosplinal cholesteatoma and because the cell activity seems to be highly significant. Against complete acceptance of this theory, however, is the difference in the frequency between aural and cerebrosplinal cholesteatoma.

JAMES C. BRASWELL, M.D.

Kopetzky, S. J., and Almour, R.: *Suppuration of the Petrous Pyramid: Pathology, Symptomatology, and Surgical Treatment*. *Ann. Otol., Rhinol., & Laryngol.*, 1931, xl, 157.

The evolution of suppuration of the petrous pyramid may be divided into four periods: (1) the period of eye pain and aural discharge, (2) the period of low-grade sepsis, (3) the period of quiescence, and (4) the terminal stage.

In cases in the first period which are reviewed by the authors, extensive pneumatization of the mastoid was found on roentgen examination and at operation. This suggested pneumatization of the petrous pyramid. The eye pain in the first period is quite characteristic. It occurs on the side of the

lesion and is limited to the region about the eye and the orbit. It is described as deep, and at the outset it is nocturnal. It must be differentiated from the pain associated with involvement of other roots of the trigeminal nerve. The latter is usually relieved by exenteration of the mastoid cells. The aural discharge in the cases reviewed persisted for some time after eradication of the mastoid infection or appeared spontaneously after the canal had become dry. In practically every instance it antedated the onset of the eye pain by several days. In two of the cases there was facial weakness of an infranuclear type and of short duration. In two cases, vertigo and nystagmus were present, but ceased with relief of the facial palsy. Vomiting occurred occasionally, but was of no significance.

The period of low-grade sepsis is characterized by a fever usually ranging between 99 and 102 degrees F. and associated with signs of pyramidal suppuration.

In the period of quiescence the patient is free from ocular pain. In the cases reviewed, this period ranged from five to nineteen days. Recurrence of the pain is ominous as it is usually indicative of invasion of the endocranium. To prevent meningitis, operative measures must be instituted prior to the period of quiescence.

The terminal period is ushered in by the classical signs and symptoms of leptomeningitis. Of chief significance is the absence of involvement of the abducens nerve (Gradenigo's syndrome).

Suppuration of the petrous pyramid must be differentiated from nasal sinus disease, lateral and cavernous sinus thrombosis, involvement of the superior petrosal sinus, acute labyrinthitis, and recurring mastoiditis.

JOHN F. DELPH, M.D.

Eagleton, W. P.: Unlocking of the Petrous Pyramid for Localized Bulbar (Pontile) Meningitis Secondary to Suppuration of the Petrous Apex: Report of Four Cases with Recovery in Three. *Arch. Otolaryngol.*, 1931, xiii, 386.

The author says that infection of the marrow-containing petrous apex differs from suppuration of the pneumatized cells of the mastoid as it is a true osteomyelitis. In a surgical attack on the apex, the squama and tympanic ring may be removed as all of the external portion of the temporal bone is solely for protection of the neural tissues of the labyrinth and brain.

JAMES C. BRASWELL, M.D.

NOSE AND SINUSES

Goldsmith, P. G.: The Treatment of Paranasal Suppuration Persisting After Operation. *Brit. M. J.*, 1931, i, 484.

Persistence of the discharge from a nasal accessory sinus following operation does not necessarily call for surgical measures of a more radical nature. The chief symptoms for which the patient sought advice, such as pain or discomfort in the head, nasal obstruction, and postnasal discharge, may have been so greatly

relieved by the operation that even if some secretion persists it may not be of sufficient importance to require further instrumental intervention.

In the frontal sinus, the removal of the anterior tip of the middle turbinate will often suffice or, when the agger nasi cells have been broken down and the nasofrontal duct has been opened, repeated washings may be sufficient. Frequently, the further removal of unbroken ethmoidal cells gives good results. This should be done before an external operation is considered. The most successful external operation is the Lynch operation.

Persistence of discharge following a sphenoid operation is usually due to failure to make a large enough opening in the anterior wall or failure to keep the opening from becoming so small that aeration and drainage are not sufficient. The opening often becomes closed by the formation of a fibrous diaphragm. The anatomical variations of the sphenoid must be considered. The recesses in this sinus can often be reached by repeated lavage. If the opening persistently becomes too small, the surgeon should wait until a thin avascular membrane has formed and then proceed to bite it away as before.

Persistence of discharge after an antrum operation is frequently due to failure to recognize the presence of frontal and ethmoidal disease. In some cases the discharge persists because the operation was not the proper procedure for the condition. In cases of edema which does not respond to simple aeration and drainage, the mucosa must be removed entirely by a more radical exposure and the antral opening made of sufficient size to prevent closure by scar formation. In some cases, persistence of the discharge is due to failure to correct an allergic state.

Suppuration high up in the nose following an ethmoid operation may be due to extension of cells into the orbit where they are unapproachable by an intranasal procedure. In such cases an external approach must be considered. JOHN F. DELPH, M.D.

Henri-Fischer: Surgery of the Frontal Sinus by the Endonasal Route (De la chirurgie du sinus frontal par voie endo-nasale). *Bull. et mém. Soc. d. chirurgiens de Par.*, 1931, xcv, 95.

The endonasal surgery discussed by the author is intended merely for drainage of the frontal sinus. The sinus itself is not touched, the operation merely enlarging the canal uniting the sinus with the nasal fossa. Hence the procedure is of no value in established sinusitis in which curetting is indicated. It is indicated chiefly for patients who have intermittent attacks of slight sinusitis and those suffering from chronic ethmoiditis with continuous suppuration and polypous degeneration who are threatened with involvement of the frontal sinus. Its purpose is to prevent the transformation of the sinus into a closed cavity and to insure its aeration and drainage.

The author describes the Vacher-Denis procedure and the Halle operation.

From anatomical studies, Henri-Fischer concludes that the agger nasi presents three super-

imposed cells which increase in size from the bottom up and are separated by thin bony partitions. This series of cells borders the anterior groove of the infundibulum. Anteriorly, the cells jut out more or less at the level of the ascending ramus of the maxilla and below correspond to the osseous ridge which is the atavic remnant of the nasoturbinal horn of certain mammals.

The highest cell of the agger nasi usually juts into the frontal sinus. The Vacher procedure by the endonasal route and the procedure of Halle consist in breaking in the cells by approaching the frontal sinus through the highest cell.

While the arrangement described by the author is the most frequent, the morphology of the agger nasi is extremely variable. The cells may be absent or have very hard walls. The cellular tier may be found on a very external sagittal plane. The superior cell of the agger nasi may be very high. The cells may replace the absent frontal sinus. Accordingly, the relations between the agger and the frontal sinus may be very different in different cases. On account of the occurrence of anomalies, all operative procedures in which the attempt is made to reach the frontal sinus at the anterior portion of the middle meatus by the endonasal route are uncertain.

In the author's procedure a roentgenographic examination is first made to determine the exact morphological relationships of the sinus. Then, under local anesthesia, the head of the median cornu is resected, the mucous polyps are ablated, the anterior ethmoid is curetted, the infundibulum enlarged, and the sinus drilled. The frontal sinus is approached by its natural opening, the infundibulum, from behind forward. In this way it is possible to break in the anterior lip of the infundibulum as well as the cells of the agger nasi found there and thus to reach the frontal sinus with greater certainty. The author has devised two special hooks and currettes for the operation.

In the discussion of this report, DARTIGUES stated that in his opinion the direct frontal route is to be preferred to the endonasal route, and that the scar of the direct frontal operation may be hidden in the eyebrow. PACE.

Stevenson, W.: Chronic Maxillary Sinusitis: An Analysis of 192 Cases That Came to Operation.
Arch. Otolaryngol., 1931, xiii, 506.

Of the 192 patients whose cases are reviewed by the author, 97 were females and 95 were males. The average age at the time of operation was thirty-five years. The youngest patient was three years old and the oldest sixty-seven years.

The cause of the condition was not determined, for while in some of the cases there were definite signs of associated pathological lesions, in others nothing abnormal besides the maxillary sinusitis could be found. However, in 16 per cent of the cases the sinusitis followed the extraction of teeth.

The chief complaint was frequent attacks of colds in the head. A great many of the patients com-

plained of a nasal discharge, and 63 complained of pain.

The most reliable diagnostic procedure is the cytological examination of Sewell. Diagnostic puncture and lavage was done 203 times. The author finds that transillumination carefully carried out is just as reliable as X-ray examination. However, X-ray examination will show a thickened membrane and sometimes polyps.

Of the 25 cases studied bacteriologically, predominance of staphylococci was found in 12.

The Krause operation was done in 171 cases, the Caldwell-Luc operation in 19, and the Canfield-Ballinger operation in 2.

The subsequent treatment was very conservative. The nose was shrunk and the opening into the antrum kept patent. Lavage was not done.

Complete recovery resulted in 183 cases (94.2 per cent). In 2 cases of tachycardia, the tachycardia subsided, and in 2 cases with a persistent daily rise in the temperature, the temperature remained normal after the operation. Patients with vague symptoms such as malnutrition and general malaise were benefited.

In conclusion the author states that the Krause operation is the procedure of choice for the primary attack on the chronic suppurating antrum; transillumination is as satisfactory as X-ray examination; nasal polyp is associated more often with disease of the antrum than with disease of other sinuses.

JOHN F. DELPH, M.D.

MOUTH

Davis, A. D.: The Surgical Correction of Cleft Lip and Palate. *Surg., Gynec. & Obst.*, 1931, lxi, 875.

The incidence of failure in the surgical treatment of congenital cleft lip and palate is estimated at from 70 to 80 per cent. There is considerable difference of opinion as to when the operation should be performed, the order of procedure, and the technique. The objects sought are anatomical and functional normality and aesthetic appearance.

The author emphasizes that in the treatment of both unilateral and bilateral clefts a cleft in the bony arch must be united prior to the other operations, and that restoration of the lip, nose, and soft tissues of the palate to normal depends on perfect union of the bony arch. The maxilla should be wired high up above the alveolar ridges both posteriorly and anteriorly to guard against spreading in the region of the tuberosities which will render the soft palate short and tense. Before the seventh month of age the cleft bones may be bent and moved to position by digital manipulation before wiring. After the seventh month it is usually necessary to place the wires in position, move the bones as closely together as possible, and then gradually tighten the wires. For the best results, the bone operation should be done in early infancy. Co-operation between the pediatrician and surgeon is of the utmost importance.

The lip should be closed from six to ten weeks after the bone operation. Numerous types of flaps for the closure of clefts of the lip have been proposed, but practically all procedures except the Brophy operation depend upon the sacrifice of a portion of the lip. The most important step in cleft lip surgery is the securing of a correct vermilion border. Among the more common errors are the production of a notch in the lip at the point of union of the flaps and the formation of a lip too long for a good cosmetic result. To prevent scarring the sutures should be removed after from three to five days. Care must be taken to shape the nostril and construct a floor for the nostril involved.

As a splint to prevent failure of union after palate operations, the lead plates and silver wires designed and used by Brophy are recommended. These are employed, not for forcible approximation of the flaps, but to render the muscular elements of the soft palate inactive.

Closure of the cleft does not assure a perfect result, but when the palate is short and tense the result may sometimes be improved by lengthening the palate with the use of the palatopharyngeal muscles and by speech training. The use of prosthetic devices is not satisfactory.

Following the formation of a normal bony arch, lateral flaps are raised, the edges are freshened, and the wound is closed with horsehair after placement of the splint of silver wire and lead plates.

Feeding after the operation is accomplished by placing milk on the back of the tongue with a medicine dropper or a rubber ear syringe.

WILLIAM G. HANX, M.D.

PHARYNX

Kaiser, A. D.: The Relation of Tonsils and Adenoids to Infections in Children, Based on a Control Study of 4,400 Children Over a Ten-Year Period. *Am J Dis Child*, 1931, xli, 568.

When hypertrophy of tonsil and adenoid tissue causes obstructive symptoms in children, surgical removal of the hypertrophied tissue is of undoubted benefit. Of 5,000 children subjected to tonsillectomy on account of obstructive symptoms, only 10 per cent failed to be relieved, and in these the failure was due to developmental defects.

The author made a study of 4,400 children to ascertain the relationship of the tonsils and of adenoids to the common infections of childhood. In the cases of 2,200 (50 per cent) the tonsils and adenoids were removed between the ages of four and seven years. The remaining 50 per cent were used as controls and studied as to the incidence of the diseases of childhood.

After tonsillectomy a marked decrease in the incidence of colds in the head was noted. Only 8 per cent of the children showed no improvement at the end of a year. The children not operated upon showed no change in the incidence of head colds. At the end of ten years, 22 per cent of the tonsil-

lectomized children and 31 per cent of the control children were subject to colds in the head, and 10 per cent of the tonsillectomized children and 35 per cent of the control children suffered attacks of sore throat.

Of the total number of children, 15 per cent had cervical adenitis. Of those with cervical adenitis who were operated upon, only 7 per cent developed a recurrence, whereas of the controls, 14 per cent developed a recurrence.

At the end of ten years, 5 per cent of the children with otitis media who were operated upon still had a purulent infection, whereas of the control children 6 per cent had such an infection. It must be remembered that there were more children with otitis media in the group operated upon than in the group not operated upon. Mastoiditis was found as likely to develop in the children operated upon as in the others.

In 2,200 tonsillectomized children, the incidence of chorea was about as high as in the control children. At the end of ten years, chorea was more common in the children who had been operated upon than in those who still retained their tonsils.

The findings with regard to rheumatic carditis were similar. Tonsillectomy seemed to offer the greatest protection against this condition between the ages of five and ten years. It appears that when once rheumatic infection has taken place the tonsils play an insignificant part as their removal offers no protection against subsequent attacks.

There is no relation between the tonsils and adenoids and chicken-pox, mumps, and whooping cough. Measles occurred with equal frequency in the tonsillectomized children and the controls, and diphtheria was more frequent in the former than in the latter. Scarlet fever occurred more frequently in the tonsillectomized children than in the controls, but had fewer complications in the former than in the latter.

The incidence of laryngitis was the same in the 2 groups, but after ten years, bronchitis and pneumonia were twice as common in the tonsillectomized children as in the others.

The presence or absence of the tonsils bore no relation to the incidence of tuberculosis.

Sinusitis sometimes occurred after the removal of the tonsils and adenoids, while nephritis occurred 3 times more frequently in the children not operated upon than in those operated upon.

In a study of 36,000 children with regard to the incidence of malnutrition it was found that this condition was only slightly more common in children not subjected to tonsillectomy than in the others.

The author concludes that removal of the tonsils and adenoids has a favorable influence on colds in the head, sore throat, cervical adenitis, otitis media, rheumatic disease, diphtheria, scarlet fever, nephritis, and dental infection, and has a favorable influence or no influence at all on chorea, measles, laryngitis, tuberculosis, and malnutrition.

JOHN F. DELP, M.D.

NECK

Telford, E. D., and Stopford, J. S. B.: The Vascular Complications of Cervical Rib. *Brit. J. Surg.*, 1931, xviii, 557.

The authors report three cases of cervical rib in which the prominent symptoms were due to thrombotic obliteration of the arteries of the arm.

In the first case, operation showed that the subclavian artery passed over the accessory rib, but was in no way embarrassed. The lowest trunk of the brachial plexus lay in a notch in the rib. Gangrene of the index finger developed and no pulse could be felt below the junction of the axillary and brachial arteries.

According to surgical textbooks, the vascular changes are due to direct pressure on the subclavian artery. The authors believe that this explanation is incorrect. They regard it as illogical to suppose that gradual interruption of the blood supply to a part can result in gangrene when the same vessels may be tied and cut without causing that sequela. Moreover, in all of their three cases there was a perfectly adequate pulse in both the subclavian and the axillary arteries, no evidence of pressure on the vessels was found at operation, and in the patients reported the vascular occlusion ended abruptly in the region of the lower border of the insertion of the pectoralis major muscle. Hence the occlusion was limited to the vessels receiving their vasomotor

supply from the peripheral nerves. As the brachial and antibrachial arteries are innervated by sympathetic fibers entering the trunks of the brachial plexus, the vascular symptoms are probably due to pressure of the cervical rib on the portion of the sympathetic which enters the arm with the lowest trunk of the plexus. Histological studies of this part of the plexus were made on eight cadavers. The appearance suggested that the fusion of the sympathetic fibers at the lowest trunk is variable and sometimes quite distal. Under the latter circumstances these fibers would be more exposed to irritation or pressure by a cervical rib than the motor or sensory fibers.

The initial symptoms in the three cases which were reported were pallor and hypothermia, which indicate vasoconstriction from irritation and not paralysis of the sympathetic fibers. Paralysis of the vasomotor fibers never seems to induce vascular changes.

The question as to whether prolonged irritation and ensuing vasoconstriction can induce arterial occlusion was studied by experiments on cockerels in which ergot was fed or injected over a long period of time. It was noticed that the combs of the cockerels shrank steadily and became a dirty bluish-gray. A study of sections showed a true arterial occlusion. The authors therefore conclude that the vascular changes seen in cases of cervical rib are due to prolonged spasm and resemble those of ergotism.

FRANK B. BERRY, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Ross, J. P.: *The Treatment of Cerebral Tumors with Radium*. *Brit. J. Surg.*, 1931, xviii, 618.

The author's investigations of the effect of radium on brain tumors was limited to gliomata, which constitute 70 per cent of primary brain tumors verified by operation, exclusive of pituitary tumors. Although there has been considerable improvement in the diagnosis and in the technique of the treatment of brain tumors, and although the immediate mortality in cases of gliomata has been greatly decreased, the chance of an ultimate cure of tumors of the latter type is slight.

The most important criterion of the malignancy of a tumor is the degree of differentiation of the neoplastic cells, the embryonic undifferentiated cells being those most active and malignant. The degree of differentiation may vary during the life of a glioma, but the tendency is toward de-differentiation. All gliomata infiltrate the brain and none of them disseminate through the lymphatics or blood stream.

Bailey and Cushing have divided the gliomata into thirteen histological groups. However, 85 per cent of them fall into three groups, from 35 to 40 per cent being astrocytomata, 35 per cent spongioblastomata, and 13 per cent medulloblastomata.

The astrocytomata have a slow rate of growth. The average duration of life after signs of the tumor have developed is from twelve to eighteen months. Spongioblastomata grow more rapidly, usually being fatal within six months after their discovery. The spongioblasts are less differentiated than the astrocytes. Still more embryonic are the medulloblasts. Medulloblastomata, which occur usually in children and always in the cerebellar region, have a rapid growth and soon break through the pia mater to develop subarachnoid growths.

When only surgical treatment is given, the average duration of life in cases of astrocytomata is about five years, but sometimes a cure is apparently obtained. The spongioblastomata are fatal within a year, and the medulloblastomata cause death even more rapidly. In cases of medulloblastoma in which Bailey and Sosman used roentgen irradiation in addition to surgery, the irradiation seemed to prolong life. It appeared to have a similar effect also in a few cases of spongioblastoma, but in many of the latter type the effect of the rays on the walls of the blood vessels caused hemorrhages. In cases of astrocytomata, irradiation caused no improvement and sometimes seemed to make the condition worse. Ewing states that, structurally, the gliomata are susceptible to irradiation since they are cellular

tumors with fragile cells and numerous fragile blood vessels and show frequent hemorrhage and necrosis.

To determine the effect of radium on normal brain tissue, experiments were performed on rabbits with various doses of radium irradiation applied in radon seeds and radium needles. The animals were killed with ether from three hours to one hundred and seventy days after the irradiation. The author concluded that radon seeds of 1.5 mc. filtered by 0.5 mm. of platinum or needles containing 1 mgm. of radium per centimeter of active length filtered by 0.6 mm. of platinum and acting for from seven to fourteen days do not cause serious damage to the cerebral cortex of the rabbit. He found no reason to suppose that a suitable application would have a harmful effect on human cerebral tissue. However, one result of irradiation was proliferation of the astrocytes.

The blind application of radium is unjustifiable as it is associated with the danger that removable tumors and cysts will be overlooked. Operation is the first indication. The most satisfactory way of determining the extent of the tumor is to remove as much of it as possible. The implantation of a large dose of radium into the tumor is not the method of choice because, on account of the danger of hemorrhage, only a brief application is possible. It is better to place small doses in the apparently normal tissue about the cavity left by removal of the tumor. Treatment of cerebral gliomata with radium alone cannot be considered at present.

It is questionable whether the external application of radium has any advantages over X-ray treatment.

For cases in which the tumor is irremovable or its extent cannot be determined, and for cases in which a deep tumor is localized by physical signs or ventriculography but is not seen at operation, the author favors X-ray treatment.

Phagocytic activity after the death of the tumor cells has not been sufficiently investigated. The dead tissue does not seem to be removed efficiently in the brain.

It is believed that radium can be used in the dosage suggested without harm, and that the majority of gliomata should respond to it.

E. S. PLATT, M.D.

Rosenberg, L., and Nottley, H. W.: Recovery from Streptococcus Meningitis. *Ann. Int. Med.*, 1931, iv, 1154.

The authors report a case of meningitis due to a hemolytic streptococcus in which complete recovery followed treatment first with anti-meningococcus serum and later with anti-streptococcus serum and neutral acriflavine given intraspinally. They then review the literature and summarize

forty other cases of streptococcus meningitis with recovery. The methods of treatment in the latter included simple lumbar puncture, intravenous and intraspinal specific serum therapy, spinal canal drainage, cisternal drainage, and mastoidectomy. The authors believe that the use of anti-streptococcus serum with neutral acriflavine is more rational than some of the other procedures and should be given a trial.

LEO M. DAVIDOFF, M.D.

Craig, W. McK., and Lillie, W. I.: The Chiasmal Syndrome Produced by Chronic Local Arachnoiditis: Report of Eight Cases. *Arch. Ophthalm.*, 1931, v, 558.

Lesions at or near the optic chiasm which may cause ocular syndromes are classified by Cushing into the following seven groups: (1) meningiomata with a parasellar point of origin, (2) pituitary adenomata, (3) craniopharyngeal pouch tumors, (4) gliomata arising from the chiasm or the third ventricle, (5) chronic local arachnoiditis, (6) syphilitic meningitis, and (7) aneurisms. The usual ocular changes produced by such lesions are: (1) a decrease in central visual acuity, (2) pale optic disks or simple optic atrophy, (3) bitemporal hemianopia for color, (4) bilateral hemianopia for form and color, (5) bitemporal scotomatous hemianopia for color or form or both, (6) temporal hemianopia with amaurosis of the opposite side, (7) temporal hemianopia with successive changes leading to amaurosis, such as central scotoma, cecentral scotoma, and enlargement of the scotoma with islets of vision and amaurosis, (8) homonymous hemianopic scotoma for form and color, (9) homonymous hemianopia for color, and (10) homonymous hemianopia for form and color.

The authors state that chronic local arachnoiditis is a definite disease entity with symptoms very similar to those produced by tumor of the same region. They report eight cases, all of which were treated surgically. Four of the patients died, one was completely cured, one showed definite improvement, one showed only slight improvement, and one showed no improvement. Pathological examination disclosed adhesions, cysts, basal meningitis, and meningo-encephalitis.

One of the patients exhibited the Gowers-Paton-Kennedy syndrome (optic atrophy and scotoma on the side of the lesion and choked disk in the other eye) on an inflammatory basis. According to the authors, this syndrome may become manifested by: (1) unilateral central scotoma with normal fundi, (2) unilateral central scotoma and pallor of the disk but normal conditions in the other eye, (3) bilateral central scotoma with pallor of both disks, (4) bilateral central scotoma with choked disk in both eyes, (5) unilateral amaurosis with simple optic atrophy and with choked disk in the other eye, (6) unilateral amaurosis with simple optic atrophy and choked disk and central scotoma in the other eye, (7) central scotoma and various alterations of the peripheral fields due to secondary contraction re-

sulting from choked disk, or (8) bilateral amaurosis with any of the foregoing changes in the fundus.

A surgical approach to the chiasm is described.

DAVID J. IMPASTATO, M.D.

Sokolov, N.: Ramisection of the Cervical Sympathetic in Paralytic Lagophthalmos (Zur Frage der Ramisection sympathica cervicalis bei Lagophthalmus paralyticus). *Vestnik. Chir.*, 1930, 1viii-ix, 465.

In a woman of sixty-three years facial paralysis developed a few days after a plastic operation on the temporomandibular articulation for habitual luxation of the mandible. Three months later a ramicotomy was done on the second to fifth cervical nerves. At first, this operation promised only moderate improvement, but, after three weeks the patient regained the power of active closure of the eye, a result considered excellent.

The ramicotomy recommended by E. Hesse is definitely to be preferred to division of the sympathetic nerve because the latter is frequently followed by ulcerative changes in the cornea.

N. PETROV (Z).

SPINAL CORD AND ITS COVERINGS

Alajouanine, T., and Petit-Dutailles, D.: The Fibrocartilaginous Nodule of the Posterior Surface of the Intervertebral Disks. An Anatomical and Pathogenic Study of a New Variety of Extradural Radiculomedullary Compression (Le nodule fibro-cartilagineux de la face postérieure des disques inter-vertébraux. Étude anatomique et pathogénique d'une variété nouvelle de compression radiculo-médullaire extra-durale). *Presse méd.*, Par., 1930, xxxviii, 1657.

Spinal cord pressure may be caused by a fibrocartilaginous nodule of the posterior surface of an intervertebral disk. The presence of the nodule gives rise usually to root symptoms and rarely cord symptoms. As a rule the symptoms are unilateral. The lesion and its manifestations are progressive. Anatomically, the clinical picture is out of all proportion to the small size of the tumor, no doubt because of the firmness of the mass of cartilage. Surgical removal is difficult because of the anterior position of the nodule with respect to the cord, but its results are excellent.

This special type of cord tumor should be considered a clinical entity. The authors have realized its importance for many years, but have recognized its significance and pathogenesis only recently. The work of Schmorl has drawn attention to the nucleus pulposus of the intervertebral disks and its possible rôle in the formation of these posterior chondromata.

The authors report two cases. The first was that of a man thirty-seven years old who suffered for four years with lumbosacral pain which at first was intermittent and later became continuous. Sensory and sphincter disturbances developed. The syndrome was that of a unilateral lesion of the cauda equina. The cerebrospinal fluid showed a slight

albuminocellular dissociation. Lipiodol was slightly impeded between the fifth lumbar and first sacral vertebrae. The first sacral vertebra assumed on the right side the character of a lumbar vertebra. A fibrocartilaginous nodule springing from the fifth lumbar and first sacral disks was removed. Recovery was rapid and complete. The patient was out of bed on the fifteenth day.

Examination of the tumor showed it to have a structure resembling that of the nucleus of the disk and containing the cells characteristic of the ves-tigial notochord.

The second case reported was that of a woman twenty years old who suffered from left lumbosacral pain accompanied by sensory, motor, and sphincter disturbances. The syndrome was that of a unilateral lesion of the cauda equina. The cerebrospinal fluid showed slight albuminocellular dissociation. Roentgenograms were negative. A nodule was removed from the third and fourth lumbar disks. Recovery was incomplete.

In a study of these cases and the cases reported in the literature it was found that the nodule arose directly from the intervertebral disk and nearly always projected into the vertebral canal on one side or the other of the midline. In ten cases the tumor was located in the cervical region; in three, in the dorsal region; and in seven, in the lumbar region. In most of the cases reported it was on the left side.

In typical cases the structure of the tumor is that of fibrocartilage throughout which are scattered a few cells of notochordal origin obviously in a stage of retrogression. The structure is neither that of a chondroma nor that of a chordoma.

The origin is probably to be found in the herniation of the nucleus of the intervertebral disk which was first studied recently by Schmorl. As the nucleus is posterior to the center of the disk, the hernia tends to occur posteriorly. Another factor is the presence of numerous perforations in the disk through which the nucleus (which is under pressure from all sides) can penetrate the spongy body of the vertebra and eventually reach the vertebral canal. Again, the hernia may develop directly through a fissured cartilage. By careful examination, the continuity of the nucleus and the extradural tumor can be demonstrated.

The pathogenesis of these pseudotumors must include traumatism. In a case reported by Middleton and Teacher in 1911 the patient felt a cracking sensation while he was lifting a piece of metal. Paraplegia rapidly developed and death followed shortly from urinary infection. At autopsy, a pre-medullary mass was identified as the nucleus of the vertebral disk.

However, traumatism cannot account for all cases. Changes of the disk and cartilage have been described. In one of the authors' cases a central softening of the disk was found at autopsy. The nature of the changes is not clear. Possibly repeated slight injuries may play a rôle.

ALBERT F. DEGROAT, M.D.

SYMPATHETIC NERVES

Coates, A. E.: *Periarterial Sympathectomy: Its Use in Ulcers, Gangrene, and Other Conditions, with a Discussion on the Etiology of Trophic Changes.* *Med. J. Australia*, 1937, 1, 339.

The author reports cases of incipient gangrene, ulcers of the leg of the nonvaricose variety, and ischemic contracture that were benefited by periarterial sympathectomy. However, the favorable effect of the operation lasted at the most only a few months. Coates believes that the results were due to interference with the vaso-constrictors which favored vasodilatation. LEO M. DAVIDOFF, M.D.

Diez, J.: *The Treatment of Obliterating Thrombo-Angiitis of the Leg by Resection of the Lumbar Sympathetic (Le traitement de la thrombo-angéite oblitérante des membres inférieurs par la résection du sympathique lombaire).* *J. de chir.*, 1931, xxvii, 161.

The author has performed resection of the lumbar sympathetic for thrombo-angiitis seventy-five times on sixty-eight patients. He reports the cases and describes the technique in detail. In some of the cases two operations were necessary as the effect of the operation is unilateral. The improvement sometimes noted on the side not operated upon is transitory and probably due to humoral changes or increased tonus of the arteries from relief of the pain.

The sequelae of thrombo-angiitis vary from slight cyanosis to gangrene of the foot. The author divides the cases into seven groups according to the stage of the disease. Of the seventy-five operations reported, seventeen were failures. In seven of the cases with a poor result the disease had already reached the stage of gangrene of the foot before the operation was performed. If lumbar sympathectomy is done in such cases it should be followed immediately by a Syme amputation. The fifty-eight other operations reported gave brilliant results. In eight of the cases with a good result there had been intermittent claudication; in sixteen, continuous pain; in five, a zone of gangrene; in twenty-seven, chronic ulcers; and in two, gangrene of the toes.

Of the patients who have been traced, two are free from recurrence after six years, two after five years, two after four years, two after three and a half years, three after three years, one after two and a half years, three after two years, six after a year and a half, four after a year, and nine after from six to eight months.

The author concludes that lumbar sympathectomy is effective in 75 per cent of cases of obliterating thrombo-angiitis. AUDREY G. MORGAN, M.D.

MISCELLANEOUS

Lutembacher, R.: *The Structure of the Nerves (Structure des nerfs).* *Presse méd.*, Par., 1931, xxvii, 278.

When the sciatic nerve of the frog is examined in Ringer's solution it seems to be composed of hollow

cylindrical tubes. A cross-section shows a dark central portion edged by a brilliant border with double outlines. The tubes are filled with a viscous fluid which molds itself to the contours of the tube and is drawn out at the strictures of the tube. The fluid mass forms the central and least refractive part of the fiber. In certain sections longitudinal striations are suggested. This appearance is due, not to a fibrillary structure, but to interference with the light on the curved surfaces.

The nerve tubes change shape with extraordinary facility. After being subjected to tension they contract, folding themselves like an accordion with numerous irregular invaginations which more or less obliterate their lumina. This change shows the plasticity of the central substance, which lets itself be pushed back by the invaginations. The invaginations break the continuity of the fluid column or favor its segmentation into finger-shaped, round, or ovoid portions with changing contours.

These findings show that the nerve tubes are conductors filled with a fluid mass connecting the central nerve cells with the motor elements. According to a physical explanation, the variations of turgescence of stimulated central cells are transmitted to

the other end of the tube, causing displacement of the fluid with a slight disturbance at that end.

According to a chemical interpretation, the stimulated cell secretes an active substance which is rich in electrolytes such as calcium or potassium and the excess thus formed is delivered to the other end of the long excretory canal and takes part in the reaction which brings about the motor act.

According to a third explanation, electrolytic conductors are subjected to the phenomena of polarization.

It is known that during the stimulation of the pneumogastric nerve the intracardiac fluid becomes richer in potassium which has an action on the heart equivalent to that of stimulation of the vagus. Zondek finds that after stimulation of the sympathetic the intracardiac fluid is richer in calcium. According to Loewi, the vagomimetic substances belong to the choline or the neurine group. Whatever their nature, these physicochemical changes require a certain amount of time. According to Henrijean, stimulation of the vagus must sometimes be prolonged fifty seconds before action is produced. On the other hand, the action continues beyond the time of stimulation.

PAGE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Cutler, M.: The Cause of Painful Breasts and Treatment by Means of Ovarian Residue. *J. Am. M. Ass.*, 1931, xcvi, 1201.

This is a report of fifteen cases of painful breasts which were treated with good results by the oral administration of ovarian residue. The author states that the pathological condition underlying painful breasts is not an inflammation, but an increase in the physiological desquamation of epithelium in the ducts and acini accompanied by hyperplasia of the surrounding connective tissue. The resulting distention of the ducts gives rise to diffuse pain and generalized nodularity. It is therefore incorrect to designate the condition as "chronic mastitis." Experimental study has shown that the hormone of the corpus luteum is responsible for the hyperplasia. It is assumed that the corpus luteum dominates the ovarian metabolism. That its over-activity even suppresses ovulation to some extent is indicated by the scantiness of menstruation, which is due to hypofunction of the follicular and interstitial elements of the ovary. The administration of ovarian residue tends to check the abnormal epithelial and connective tissue hyperplasia by counteracting the excessive corpus luteum secretion and thereby removing or diminishing its over-stimulating influence on the elements of the breast.

Treatment with ovarian residue results in: (1) relief of the pain and tenderness in the breasts, (2) softening of the breasts and diminution or disappearance of the nodularity, (3) restitution of the menstrual periods to a more normal state, and (4) improvement in the general condition.

MAURICE MEYERS, M.D.

Askanazy, M.: The Benign Diseases of the Breast in Their Relation to Breast Carcinoma (Die gutartigen Erkrankungen der Brustdrüse in ihren Beziehungen zum Mammacarcinom). *Zentralbl. f. Chir.*, 1930, pp 3050, 3056

Benign diseases of the breast which may lead to carcinoma are inflammations, cystic disease, benign tumors, and malformations. Malformations play a less important rôle in the breast than in other regions. Paget's disease is no longer included with the inflammations as Paget cells are the cells of a breast carcinoma which are distributed in the epidermis. The most important benign disease which may lead to carcinoma is the cystic breast.

According to the histological picture, cystic breast is preceded by a cystic epitheliobiosis. The author has never seen a cystic breast without epithelial proliferation, and rejects the theory of a secondary epithelial proliferation following a primary fibrosis

or fibromatosis. The epithelial proliferation is essentially a papillary proliferation which grows into canaliculi that have been dilated by increased activity. The cystic breast develops in a pure form (which is neither mastitis nor tumor) from the ordinary irritation which persists after inflammation. At autopsy, the author has found latent stages in nearly one-fourth of all women under forty years and in one-third of those over forty years. Cancer development begins from the epithelium of cysts with papillae and from small enclosed blastoids or tumors such as cystadenomata. Radical operation should be done when the distended canals are filled with multiple epithelial layers, numerous mitoses, polymorphous epithelial cells, and necroses. Carcinoma arising from cystic breast may assume any form of breast cancer.

With the exception of cystadenomata, malignant degeneration of benign tumors is more common than is generally believed.

Benign diseases of the breast create potentially cancerous epithelial cells and thereby a local tendency toward cancer. Cancer development depends on irritation.

Korr (2).

Frangenhelm: Benign Diseases of the Mammary Gland in Their Relationship to Carcinoma of the Breast (Die gutartigen Erkrankungen der Brustdrüse in ihren Beziehungen zum Mammacarcinom). *Zentralbl. f. Chir.*, 1930, p. 3050.

The conditions known as "mastopathia" or "chronic cystic mastitis" can sometimes be differentiated clinically from cancer of the breast only with difficulty or not at all. Because of their alleged close relationship to cancer of the breast, they are called precancerous, and their early removal seems to be the best prophylaxis against mammary cancer. Since the development of the precarcinomatous condition is frequently manifested first by an abnormal secretion from the nipple, the problem of bleeding nipple assumes great interest. However, a bloody discharge from the nipple does not occur in every case of mammary cancer; in fact, in 485 cases of malignant tumor of the breast, Singer did not see a bloody discharge in a single instance, and in 200 cases Deaver found it only twice.

The bleeding is constant; it resembles venous blood, but microscopic examination offers no clue as to its nature. Though Gronwald thought that a bloody discharge appears only with the occurrence of malignant change, Knöflach and Urban observed several cases in which it ceased and the patient remained cured during an observation period of ten years. However, though the phenomenon cannot be regarded as an early manifestation of malignant degeneration, Mintz states that malignant degenera-

tion may nevertheless occur years later. He therefore regards the bleeding nipple as a warning signal.

Chronic cystic mastitis holds first place among diseases of the breast from which carcinoma may evolve. It is a latent condition; only cases which present the bleeding nipple sign attract attention. Among the many who have studied the problem are Erdheim, Hellwig, Klose, Knodloch, Urban, Konjetzny, Pribram, Sebening, and Semb. These investigators found polyp-like structures in the milk ducts which bled easily. Erdheim, Risak, and others regarded them as harmless, whereas Klose maintained that they are malignant. Sebening called attention to the fact that polyps in the bladder, prostate, and renal pelvis, and those found in catarrhal conditions of the gastro-intestinal tract have a tendency to undergo malignant degeneration. While fibro-adenomatosis simplex and cystica, which is characterized by the development of atypical infiltrating tumor tissue, may behave normally, it may sometimes infiltrate atypically and thus undergo malignant degeneration. On the other hand, the benign, sharply delimited fibro-adenoma appears to undergo malignant degeneration only very seldom.

Opinion regarding treatment is equally divergent. Klose and Sebening demand amputation of the breast affected with chronic cystic mastitis, whereas Hellwig rejects this treatment as unnecessary and mutilating and believes that partial extirpation is usually enough. The author is of the opinion that in the cases of young women, partial resection may be done, whereas in those of older women, particularly those in which the condition is more diffuse, amputation is best.

In the discussion of this report, KAISERLING said that when 1 section is examined the condition may be judged benign whereas when 4 different sections are examined 3 may be found benign and the fourth definitely malignant. He believes that there is no transition stage; that cancer develops as cancer from the beginning.

TEUTSCHLAENDER maintained that the constitution plays an important rôle in the development of the new growth. In support of his opinion he cited the fact that mixed tumors of the breast are rare in the human being, but are common in the mouse and the cat. In his material, simple mastopathia was found in 23 per cent of the cases, mastopathia with carcinoma in 25 per cent, and cystic proliferating mastopathia with variously advanced stages of precarcinomatosis in 41 per cent.

DIETRICH stated that epithelial changes which may terminate in malignant degeneration may occur in the breast as a result of the regressive phenomena and renewed hyperplasia associated with the menstrual cycle. He found carcinoma in 25 per cent of his cases of cystic breast.

LAEWEN said that carcinoma of the mammary glands occurs only very seldom following a benign tumor of those glands. Among 617 cases of carcinoma operated upon in Königsberg during the past thirty years he found only 11 cases of carcinoma of

the breast following a previously determined benign tumor of the breast. In 64 cases the development of the cancer had been preceded by a hardening in the breast, but the latter had not been examined histologically. In 87.8 per cent of the cases of breast cancer, there had been no previous affection of the mammary gland.

ASCHOFF agreed with Askanazy that an inherited anlage plays an important rôle in the development of cancer. With regard to the cause of chronic cystic mastitis he stated that Dietrich's statements concerning the influence of the menstrual changes deserve special emphasis. The epithelial processes in the uterus play a similar rôle in the development of metropathies. Both affections usually appear at the beginning and at the end of the period of menstrual life. Aschoff said that as an anatomist is unable to state whether malignant degeneration begins and progresses suddenly or gradually, it was unable to give any advice as to whether radical removal or partial resection should be the operation of choice.

FISCHER called attention to the fact that the histological diagnosis of malignancy does not correspond to the clinical conception of cancer. He does not admit a precarcinomatous stage of cystic breast although the condition certainly suggests such a stage histologically. As some women desire the removal of the breast because of anxiety and others take the suggestion of amputation as proof that cancer is present and thus suffer a shock, the surgeon finds himself in a precarious situation.

A. ROSENBERG (Z).

TRACHEA, LUNGS, AND PLEURA

Eloesser, L.: Congenital Cystic Disease of the Lung. *Surg., Gynec. & Obst.*, 1937, lii, 747.

Congenital cysts of the lung occur in two forms: the solitary cyst and the multiple or more or less diffuse cystic degeneration of parts of the lung. The two may co-exist. Solitary cysts may lie within the parenchyma. They may occupy the site of a whole lobe or they may sprout from other intrathoracic organs to which they are developmentally attached.

The first case reported by Eloesser was an example of both solitary and diffuse cystic degeneration. The second form is commonly called "congenital bronchiectasis" or "honeycomb lung" and is probably more frequent than the first. All or a part of one lobe or the entire lung may show various degrees of cystic degeneration. Mild degrees of the condition are usually accompanied by more or less atelectasis. There has been considerable controversy as to whether pronounced cystic changes with saccular or clubbed dilatation of the bronchial endings are congenital or acquired. They may be present at birth or in the first few months of life. Some think they are due to a persisting fetal atelectasis; that the bronchi expand because of the absence of yielding alveolar tissue. The problem is difficult, for the history of acute respiratory infection in

children, following which symptoms first appear, speaks neither for nor against such an infection as a causative factor of the condition. The infection may merely change an aseptic and symptomless cystic lung into an infected, suppurating lung, thus making the disease manifest. The cysts by themselves may cause no symptoms as long as they are uninfected. Whatever its origin may be, cystic dilatation of the bronchi has been found in newborn and fetuses.

Very often, congenital bronchiectasis presents an irregular conglomeration of cysts, some without any connection with the bronchial tree, but all lined with a single layer of ciliated epithelium and with walls usually free from ulceration or inflammatory deposits. In the congenital form the cystic areas are free from carbon and inhaled pigments, whereas in the acquired form, inflammation and ulceration are present. The author reports three cases of this type of multiple cystic degeneration of the lung. The infantile type of the disease is characterized by sudden attacks of intense dyspnoea and cyanosis. It is possible that some of the attacks may be caused by spontaneous pneumothorax. From other observations it appears that there is a rather sudden hyperinflation of a cystic lung with displacement of the mediastinum.

Recognition of the milder forms of cystic disease is unimportant and often impossible. In the infantile form, unexplained recurring severe attacks of cyanosis and dyspnoea with signs suggesting pneumothorax should arouse suspicion and should lead to X-ray examination.

In the adult cystic disease may remain silent as long as the cysts are sterile and filled with mucus or air. When infection occurs, they present the picture of a widespread bronchiectasis. The chest wall of the affected side is retracted. Bronchoscopy may reveal anomalies of the bronchial tree. The roentgenogram may show a single large annular shadow if the cyst is empty, or a globular area of density if the cyst is full of fluid. If the cysts are multiple, clusters of them may be seen.

In the differential diagnosis the solitary cysts are most frequently confused with echinococcus cysts, interlobar empyema, dermoids, and solitary tumors. Multiple cysts of medium size are more easily recognized. It should be borne in mind that any unusual cavity which shows no tendency to contract after operation may be, not an empyema, but a congenital cystic lung. Treatment is indicated only in the presence of symptoms. Extirpation may offer considerable difficulty. An infected cyst should be drained first. After the cysts are clean the shell of the lobe containing them should be dissected free. This may be difficult in the interlobar fissures and along the diaphragm. The pedicle should then be carefully tied and the cystic area amputated.

The author does not regard extrapleural thoracoplasty as the treatment of election as the drainage from the cysts may be completely shut off by the compression, the development of severe suppuration being thus favored. FRANK B. BERRY, M.D.

Bruns, E. H., and Casper, J.: *Chest Surgery in the Treatment of Pulmonary Tuberculosis*. *Mil. Surgeon*, 1931, lxviii, 311.

Spontaneous healing of lung cavities is an exception to the rule, but such cavities heal when the lung is relaxed or collapsed. When pleural adhesions prevent collapse by artificial pneumothorax, it is necessary to resort to surgical collapse by phrenico-exeresis and thoracoplasty. Surgical collapse may be used also to arrest and heal the lesions of active tuberculosis of the lungs when pneumothorax therapy has failed or is only partially successful. If thoracoplasty is performed early and in the presence of clear indications the operative mortality and postoperative chest deformity are reduced. The ideal case for thoracoplasty is one in which roentgen examination reveals a shrunken lung containing caseofibrous lesions and cavitation and hypertrophy of the other lung. Involvement of the other lung is not necessarily a contra-indication.

The majority of the patients treated by the authors had long-standing advanced fibrous tuberculosis with cavitation. In many, the condition was bilateral. In bilateral cases one lung is usually more involved than the other. An attempt should be made to clear up the perifocal reaction around the lesion in the less involved lung by rest and fresh air. As fibrosis develops, the less involved lung becomes hypertrophied. The authors sometimes employ artificial pneumothorax and phrenico-exeresis, but if the base of the involved lung is free from tuberculosis, phrenico-exeresis is avoided as an effort is made to conserve this portion of the lung. When once fibrosis is evident, thoracoplasty is performed by stages. Before the operation, blood-chemistry studies and blood typing are done, the basal metabolic rate and vital capacity are determined, electrocardiograms are made, and digitalis is administered. On the day of the operation the patient is encouraged to drain the lung cavities. The operation is performed under nitrous oxide-oxygen anaesthesia supplemented by blocking of the intercostal nerves with novocain. The upper stage is usually done first as the cavity is generally in the apex or the upper part of the lung and if the lower stage were done first little or no effect would result until the second or third stage was completed. As a rule, a posterior extrapleural thoracoplasty is done with wide resection of the five upper ribs. Care is taken to avoid mediastinal flutter and paradoxical breathing.

After the operation, normal salt solution is given by hypodermoclysis and proctoclysis. Intravenous therapy is avoided if possible, and when it is necessary, it is used with great caution. The patient is encouraged to cough soon after the operation in order to keep the cavities drained.

It is better to remove too few than too many ribs. When from seven to nine ribs must be removed, it is advisable to remove ten ribs in order to preserve the symmetry of the chest.

The authors state that their experience with the paraffin pack and the type of case in which it is em-

played has been too limited to permit conclusions as to the value of this procedure.

EARL O. LATIMER, M.D.

Bérard, L., Bérard, F., and Denis, R.: A Simplified Technique of Apicolysis (Une technique simplifiée de l'apicolysse). *Presse méd.*, Par., 1930, xxxviii, 1497.

Apicolysis was devised in 1891 by Tuffier. In 1926, Tuffier reported fifty-seven cases in which it was done. The operation was thereafter abandoned in France for some time, and has only been recently revived through the influence of Austrian and Hungarian surgeons. The latter employ the posterior route and fill the dead space with paraffin.

The pleural cavity has the form of a cone with a rounded apex. This apex, which is the part illuminated in apicolysis, is bounded below by an arbitrary line passing through the first interspace anteriorly and the third interspace posteriorly. The parietal pleura is easily mobilized everywhere except at the extreme apex, where it is suspended by the costovertebral, the vertebropleural, and the transversopleural ligaments. This point of fixation has suggested the use of the superior route through the supraclavicular fossa (Lawers) for apicolysis. The obstacles are numerous, however, and the resistant plane, against which the compressing agent opposes the internal forces, is resected.

The suspensory ligaments can be ruptured without actually exposing them. Therefore a technique has been developed which makes it possible to introduce paraffin between the intact osseous and aponeurotic cover of the thorax and the compressed lung.

The lung is approached, not at the apex, but at the base of the apical cone which is to be compressed. The anterior or posterior route may be employed. The authors prefer the anterior route because of the greater thinness of the chest wall and because the third rib need not be resected and hæmostasis (absolutely essential) is more easily accomplished by this route. Resection of a portion of the second rib is necessary only in the cases of women and children.

A horizontal incision 6 cm. long is carried laterally in the first interspace from a point 1 cm. from the border of the sternum. The fibers of the pectoralis major are separated and the pectoralis minor is retracted laterally. The intercostal muscle is then split medially and detached from the upper border of the second rib. This step is very delicate, particularly if the pleura is not thickened and adherent to the lung. Through the opening obtained, the pleura is separated with the gloved finger upward and laterally. If oozing is abundant, the dissection is continued with gauze moistened in saline solution. When the pleura can no longer be reached with the finger, a broad blunt instrument may be employed, but every care must be taken to avoid tearing the membrane. When separation has been completed, the cavity is packed with a mixture of 1,000 gm. of paraffin with a melting point of 50 degrees C., 15

gm. of neutral bismuth carbonate, and 3 gm. of "vioforme." The mixture is melted and then cooled sufficiently to give it a pasty consistency. It is packed into the cavity, and the pectoralis muscle and skin are closed.

As a rule this operation is combined with phrenicotomy on the same side.

The degree of collapse obtained is believed adequate although the medial surface of the lung is not mobilized and a thin layer remains attached to the mediastinum.

A serous pleural effusion often follows the apicolysis, but becomes absorbed spontaneously.

The operation has been performed too recently for the final results to be known, but thus far its effects have been very favorable.

ALBERT F. DE GROAT, M.D.

Léon-Kindberg, M., and Soulas, A.: Bronchoscopy in the Treatment of Pulmonary Abscess (La méthode bronchoscopique dans le traitement des abcès du poumon). *Presse méd.*, Par., 1930, xxxviii, 1591.

The variety of procedures which have been proposed for pulmonary abscess is explained by the many variations in the clinical aspect and evolution of the condition. However, during the last ten years general agreement has been reached as to the best treatment and today there is a difference of opinion only with regard to the details.

Spontaneous recovery from lung abscess occurs in only from 20 to 25 per cent of cases. Therefore surgical treatment is usually necessary. However, it is generally agreed that, except in rare instances, operation is inadvisable before the eighth week. A persistent or chronic abscess demands surgical intervention. Serum therapy and other medical treatments are of no value. Between medical and operative measures there is bronchoscopy. Bronchoscopy has been highly developed largely as the result of the efforts of Jackson.

In the United States, bronchoscopy has been employed only as palliative treatment of chronic lung abscess or atelectasis. In the authors' opinion it is of value during the pre-operative stage as an aid in limiting and attenuating the infection and should be included also in the postoperative treatment.

Although they cannot prove their assumption by statistics, the authors believe that bronchoscopic treatment will lead to recovery without operation in many cases of acute abscess and sometimes even in those in which the acute stage has passed. It is an excellent means of preparing chronic abscesses for operation and a good measure to render the infirmity less distressing to the patient.

Nine illustrative cases are reported with roentgenograms. The first three were cases of acute abscesses which had been present for from one month to six weeks. In one case, the bacterial flora included spirilla and fusiform bacilli. The treatment consisted of aspiration of the bronchial

secretions and the injection of oil of eucalyptus or lipiodol. In the three cases, two, seven, and eight treatments were necessary. The symptoms immediately subsided and all of the patients recovered clinically. Roentgen examination showed progressive obliteration of the cavities. The maximum time required for cure was five months.

Of the two patients who were seen during the subacute stage of the disease, both improved rapidly.

Of the four patients with chronic abscesses, one recovered rapidly after one treatment. The three others improved rapidly and, being clinically cured, abandoned treatment although roentgen examination still showed the presence of small cavities. All three of these patients developed an acute recurrence of the suppuration. One of them died and another is awaiting surgical treatment.

All of the patients except one were adults over thirty-two years of age. Two were fifty-one and sixty-three years old. The youngest was twenty-four years. When a Vincent-like infection was present, neo-arsphenamine was administered. In two cases with very foul sputum, anti-gangrene serum was administered subcutaneously and intratracheally. The authors conclude that the ordinary pyogenic infections respond best, and that the chances for a successful result are less favorable in infections due to spirilla.

In conclusion the authors state that while bronchoscopic treatment cannot replace surgery, it allows a choice as to the time for operation. It is of special value in cases of abscess near the hilum in which surgery is associated with grave risk.

ALBERT F. DE GROAT, M.D.

Rathery, F., and Waltz, R.: Necrotic Nodular Spirochaetosis. Terminal Gangrenous Infection (Spirochétose nodulaire nécrotique. Infection gangréneuse terminale). *Arch. méd.-chir. de l'appar. respir.*, 1930, v, 395.

Bezangon and Etchegoin, and recently many others, have called attention to the frequency with which, during the course of pulmonary gangrene, spirochetes are found in the sputum and the gangrenous walls. These spirochetes, whether they are Vincent's spirilla or a peculiar spirochete, the spirochete of Bezangon and Etchegoin, are now considered important. They are present in almost every case, but it is difficult to determine the rôle of the spirochetes on the one hand and the rôle of the Veillon flora on the other.

The authors were able to make this determination in the case of a diabetic. After an abdominal traumatism, the patient developed a subacute pneumopathy which was complicated after two months by rapidly fatal gangrenous phenomena. Anatomical examination of the lungs showed that the primary lesion was a necrotic nodular spirochaetosis to which, in certain areas, a gangrenous lesion had been added by anaerobic transplantation.

This case furnished the first anatomical confirmation of the occurrence of an autonomous pul-

monary spirochaetosis, which for some time had been considered possible but had never been proved. It is reported in detail.

The right lung was very adherent to the thoracic wall and the pleura on the right side was thickened and in places white. When the lung was sectioned a gangrenous excavated zone and areas of whitish condensation were found.

The whitish condensations varied in size. Most of them consisted of nodules comparable to the nodules of tuberculosis and varied from the size of the head of a pin to that of a grain of millet. They were either disseminated or grouped together.

In the parenchyma of the lung there were other condensations which were less numerous and about the size of a cherry stone. Sometimes these were in the form of triangular areas with their bases toward the pleura. They suggested foci of pulmonary infarction or zones of tuberculous inflammation.

Most of the condensations were excavated and contained putrid fluid.

The cavity with a distinct contour was hollowed out of the necrotic tissue and was without a membrane. It was always excentric, at the edge of the necrosis. Some of the necrotic areas were bordered by several cavities. In some of the condensations the cavitation process was more accentuated than in others. Under such circumstances it was bordered by a more or less thick white shell.

Examination of the left side of the chest disclosed pleural adhesions and pleurisy with a villous and congested appearance. The left lung showed nodular necrotic lesions, four or five subpleural triangular foci, three of which were excavated and contained fetid fluid, and an excavated pyramidal lesion.

In both lungs there were foci of mild bronchopneumonia with disseminated nodules.

Histological examination showed that in the zones of dissecting gangrenous pneumonia the walls and septa were not preserved. The only natural limits left were the pleura and the interlobular septa. It was difficult to stain these zones. The magma contained in the cavity was an amorphous mass which stained poorly. In many cases three zones could be distinguished in the wall: (1) an internal or gangrenous zone, (2) a middle, necrotic zone, and (3) an external zone of necrotic alveolitis. The internal zone was always present, but the middle zone was sometimes absent. The external zone was seldom totally absent, and the internal zone was seldom in direct contact with the bronchopneumonic lung. At least the fibrinoid portion of the external zone persisted. The same zones were found in the innumerable septa or bands which separated the different cavities.

Similar lesions were found in the white zones. At the base of all of them there were necrotic nodules ranging from the size of a pinhead to that of a millet seed. The necrotic nodules were characterized essentially by necrotic alveolitis.

At the center or at the periphery of the nodule one or more isolated arteries were nearly always

found. These vessels showed considerable change. The principal lesion was a vegetating and obliterating endarteritis with very little thrombosis.

Some of the lesions in the vicinity of the nodule were those of a mild broncho-alveolitis, usually of the leucocytic type. Others represented the re-actational processes which manifest themselves in contact with necrotic lesions.

Well-developed bronchopneumonic lesions were constant around the foci of gangrene and in the septa of the areas of dissecting pneumonia. They consisted of seroleucocytic and suppurative broncho-alveolitis. The severity of the bronchial lesions contrasted with the integrity of the blood vessels.

Bacterial emboli were present at numerous points in the lungs. Pleural lesions were very frequent and often emphasized.

Pulmonary gangrene may be regarded as resulting from the association of two processes—necrosis, which is most frequently spirochetal, and gangrene from the transplantation of anaerobes to the preceding lesions. Although the putrid graft on the necrotic nodules is frequent, it is far from being the rule and many nodules are enclosed in a fibrous shell. It appears logical to suppose the existence of spirochetal pneumopathies developing sometimes toward encystment and sometimes toward secondary gangrenous infection. Hence it is necessary to look systematically for spirochetes in the sputum in cases of obscure subacute pneumopathy. It is logical also to attempt treatment with arsenic as well as with emetine. PACE.

Menne, F. R., Bissillon, M., Robertson, T. D.: *Bronchogenic Carcinoma. Northwest Med.*, 1931, *xxx*, 155.

The authors report a clinical and pathological study of sixteen cases of bronchogenic carcinoma. They classify bronchogenic carcinomata into those of a hilar nodular type and those of a diffuse necrotic type. The former, which were found in 62.5 per cent of their cases, are characterized by concentration of the nodules at the hilus with a tendency toward mediastinal invasion. The latter are characterized by diffuse dissemination of the nodules into the parenchyma of the lung with minimal concentration at the hilus.

Microscopic study of the tumors showed a confusion of cell types so undifferentiated that their specific origin was not readily determined. The primary bronchogenic carcinomata were found to originate as a rule from the primary and secondary divisions of the bronchi in the zone of the bronchial mucosa where the stratification begins to taper off into a single layer of epithelium. In the authors' opinion, they probably never arise from the atrial epithelium.

The tumors of the hilar nodular type were usually associated with symptoms which were referable to the lung, while those of the diffuse necrotic type were usually associated with symptoms which were referable to the pleura.

From a review of the literature, the authors conclude that there has been a definite increase in the incidence of primary bronchogenic carcinoma.

SAMUEL PERLOW, M.D.

HEART AND PERICARDIUM

Jansson, G.: *A Contribution on the Roentgen Diagnosis of Diverticulum of the Pericardium* (Beitrag zur Roentgendagnostik beim Perikarddivertikel). *Acta radiol.*, 1931, *xii*, 50.

The author reports a case of diverticulum of the pericardium which showed roentgen findings similar to those noted in a case recently reported by Klenböck and Weiss, and, in addition, presented a roentgen sign not hitherto described which made it possible to differentiate the accumulation of exudate from a tumor. The shape of the pathological shadow arising from the mediastinum was observed to be distinctly different during various phases of respiration. During deep inspiration it was long and narrow, whereas during forced expiration it became rounder, shorter, and broader. The shadow suggested a soft, plastic mass, thereby ruling out solid tumor formation.

ESOPHAGUS AND MEDIASTINUM

Belinoff: *The Treatment of Acute and Chronic Corrosive Oesophagitis* (Ueber die Behandlung der Oesophagitis corrosiva acuta und chronica). *Ztschr. f. Hals-, Nasen-, u. Ohrenheilk.*, 1930, *xxvii*, 538.

Belinoff does not accept the results of early bougienage since they are based only upon statistics and not upon pathological or pathologicohistological data. Statistics are too subjective and are therefore misleading. As he is unable to offer any information regarding the histopathology of corrosive oesophagitis, he limits himself to what the clinic has yielded.

In the course of corrosive oesophagitis four stages are to be differentiated: mucosal necrosis, ulceration, granulation, and cicatrization. In the first two stages, bougienage is contra-indicated by the danger of perforation; inflamed organs must be left at rest. In the stage of granulation, bougies should be used to prevent the walls from uniting and causing stenoses. This stage may be recognized from the roentgen picture and by oesophagoscopy. As the ulcers no longer tend to extend in depth, bougies may be introduced at this time without danger if care and a proper technique are used.

In the first two stages, injections of oil are made into the oesophagus. For this purpose the author recommends a tampon syringe constructed like the Trendelenburg tampon cannula. The syringe is introduced into the oesophagus as far as possible without the use of force, the balloon filled with air, and the oil then injected. The treatment with the tampon cannula is begun in the first days after the corrosion. SALZER (Z).

Sapožkov, K.: Cancer of the Diaphragmatic Portion of the Oesophagus and Its Surgical Treatment (Die Krebse des diaphragmalen Abschnittes der Speiseröhre und deren chirurgische Behandlung). *Vesnik. Chir.*, 1930, lvi-lvii, 73.

The author designates the lower end of the oesophagus as the diaphragmatic portion. To this part belong the portions usually called the lower thoracic and abdominal sections. The so-called abdominal portion is very inconstant and to be defined exactly only in the anterior wall, the posterior wall being wholly or nearly wholly extraperitoneal. As it is surrounded by the pedunculi of the diaphragm, it belongs to the diaphragm as well as to the abdominal cavity.

A palliative operation was performed by the author in three cases of carcinomatous stricture of the oesophagus at the cardia. It consisted in division of the muscular strands of the diaphragm at the oesophagus with mobilization of the entire diaphragmatic portion of the oesophagus. After the operation there was transient improvement in swallowing in two of the cases but no improvement in the third.

Three patients were subjected to radical operation. The method of operation was as follows:

A median abdominal incision was made from the ensiform process to the umbilicus. The edges of the incision being then retracted, the left lobe of the liver was pulled forward. Division of the triangular ligament and the fibrous appendix was done to render the liver freely movable, and the liver pulled well over to the right. In this way the entire undersurface of the diaphragm was exposed and rendered accessible. The oesophagus was then grasped with the second and third fingers of the left hand and the stomach pushed downward with the volar surface of the hand. The central tendon of the diaphragm was divided in the direction of the oesophagus and the peritoneum at the diaphragm pushed aside by blunt dissection until the muscle fibers of the diaphragm which encircle the oesophagus were reached. The central tendon was then divided to the oesophageal hiatus by an incision about $2\frac{1}{2}$ cm. long (hiatotomy). Through the opening so formed two fingers were introduced into the mediastinum and the oesophagus was mobilized with the utmost possible gentleness to a point 2 cm. above the tumor. This having been done, the cardia was mobilized and both vagi were divided. The gastro-splenic and gastrocolic ligaments were then divided, mobilization of the upper portion of the stomach being thereby achieved. Next, an incision was made in the inferior cervical triangle on the left side, the oesophagus was opened at this point, and an olive-tipped sound introduced through it as far as the tumor. Just above the tumor the oesophagus was ligated with a ligature introduced through the abdominal opening and then divided. Another ligature was placed around the oesophagus above the tip of the sound, and by pulling on the sound the entire thoracic portion of the oesophagus was

invaginated and drawn out through the wound in the neck. The oesophagus was then disinvaginated and resected, and a cervical oesophagostomy was made. The oesophageal hiatus of the diaphragm was closed by suture and the entire upper portion of the stomach with a large portion of the thoracic oesophagus was resected. The aboral portion of the stomach was then closed and sutured to the anterior abdominal wall for a gastrostomy.

One of the patients operated upon in this way died of peritonitis on the twelfth day after operation. The infection was due to the bursting of a large pus pocket in the anterior abdominal wall which was not found until autopsy was performed. One died of pneumothorax during the operation. The third developed pneumonia and ulcerative colitis and died of ulcerous endocarditis (without any infectious foci in the peritoneal cavity or mediastinum) on the fifty-third day after the operation.

In conclusion the author says that, while he is unable to report any cures, he believes the operation described may sometimes be followed by relief.

N. PETROV (2).

Eggers, C.: Resection of the Thoracic Portion of the Oesophagus for Carcinoma. *Surg., Gynec. & Obst.*, 1931, lii, 739.

Up to the present time, surgery for carcinoma of the oesophagus has been unsuccessful for the following reasons:

1. The patients are usually of advanced age and often suffering from some degenerative processes of senility.
2. The lesion is found to be situated in the deepest portion of the thorax where access is exceedingly difficult.
3. Cancer of the oesophagus shows the same degree of malignancy and tendency to spread along the lymph channels as carcinoma of other organs. Hence adhesions to vital organs may make its removal impossible.
4. The patients are usually in very poor condition from cachexia and inanition when they first appear for treatment.

If the patient seems to be a fair surgical risk, his general condition should be improved as much as possible before operation by mouth hygiene, rest, general measures to increase his resistance, and possibly one or more transfusions. As there is usually more or less obstruction, a preliminary gastrostomy should be done and the patient fed by the gastrostomy opening and by mouth as much nourishment as he will take.

In the induction of anesthesia for the operation, no special apparatus is necessary. The ordinary nitrous oxide-oxygen-ether machines are well adapted to operations on the oesophagus. Intrapulmonary pressure may be varied by increasing or decreasing the pressure in the bag.

The operative technique recommended is that first described by Torek several years ago. A trans-thoracic approach is made through the entire length

of the seventh intercostal space on the left side with division of the posterior ends of the seventh, sixth, fifth, and fourth ribs. The mediastinal pleura is split and the œsophagus brought into view and examined. If the œsophagus is found to be operable, it is divided below the tumor with a cautery and its lower end is invaginated into the stomach. It is then freed and all vessels are carefully tied well up to above the arch of the aorta. The pleura is opened at this point and dissection is continued up into the root of the neck. The incision is made along the anterior border of the sternomastoid, the œsophagus in the neck is located, and the dissection is then completed from that already done below. The œsophagus, with its tumor, is then pulled out through the opening in the neck, a transverse incision is made over the second intercostal space, the skin is tunneled, and the œsophagus is delivered on the anterior chest wall at this point and sutured to the skin edges. The chest and neck wounds are then closed.

A small tube may be left in one of the lower intercostal spaces in the chest to allow for a pleural reaction. As the chest wound is closed the lung should be fully inflated. The neck wound is closed and the œsophagus carefully stitched to the skin edges in its new site.

The operation is of considerable magnitude and associated with considerable shock. Several interruptions may be necessary. After its completion, transfusion and treatment for shock may be required. During the first twenty-four to forty-eight hours after the operation water is given by hypodermoclysis and by rectum. Thereafter it is given also by the gastrostomy.

When the patient has recovered, a rubber tube may be fitted from the œsophageal fistulous opening made over the second left interspace into the gastrostomy opening in the stomach. The patient should then be trained to use this tube. Eventually he will be able to take foods by mouth.

FRANK B. BERRY, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Kunz, H.: The Serum Treatment of Peritonitis (Zur Serumbehandlung der Peritonitis). *Zentralbl. f. Chir.*, 1930, p. 2782.

Since numerous investigations have demonstrated that anaerobes play a very important part in a very large percentage of cases of appendicitis, it is not sufficient. In peritonitis due to appendicitis, to employ only antitoxic colon bacillus serum in addition to surgery. It is necessary to use a polyvalent anaerobic serum, as has been done in France for some time.

In France, Weinberg and his school have studied this problem and have reported very good results. The Pasteur Institute recommends the following serum mixture for appendicitis: antiperfringens (Welch-Fraenkel bacillus) serum, 40 c.cm.; anti-sporogenes serum, 20 c.cm.; anti-oedematis (Novy bacillus) serum, 20 c.cm.; antivibrio septique (bacillus oedematis maligni) serum, 10 c.cm.; and antihistolytic serum, 10 c.cm. The mixture is diluted with 500 c.cm. of physiological salt solution before being injected.

In Germany, a serum similar to that of the Pasteur Institute and a serum containing tetanus bacillus antitoxin in addition to the same four anaerobes are made. The Viennese Serotherapeutic Institute uses a serum of the latter type.

Since many cases of appendicitis are due to the colon bacillus, the Graz Clinic recommends the use of a mixture of anaerobic serum and antitoxic colon bacillus serum. In Germany, a serum of this type is made of equal parts of colon bacillus serum (Katzenstein) and gas gangrene serum. At the Graz Clinic this was used in thirty-seven cases of peritonitis following perforated appendicitis, 25 c.cm. being given intravenously and 50 c.cm. intramuscularly. It was always diluted, and in severe cases was repeated until the third or fourth day. While its use has been rather limited to date, the author believes it has a favorable effect.

VON TAPPEINER (Z).

GASTRO-INTESTINAL TRACT

Gutmann, R. A.: The Indications for Roentgenoscopy and Roentgenography in Diseases of the Digestive Tract (Indications respectives de la radioscopie et de la radiographie dans les maladies du tube digestif). *Presse méd.*, Par., 1931, xxxix, 217.

It is generally believed that roentgenoscopy is the important procedure in gastro-enterological diagnosis; that a good screen examination is usually sufficient. However, in cases of duodenal ulcer roentgenoscopy often fails entirely to reveal the lesion. Unless there is an irregularity in the shape of the

duodenum, it shows only a bulbar and gastric hyperkinesia or a pyloric spasm from irritation of the bulb which may be due to a duodenal ulcer or to disease of the gall bladder or appendix. The most important sign of duodenal ulcer, the niche in the surface, can never be seen on the screen.

One of the most difficult lesions to visualize is the juxtapyloric ulcer of the lesser curvature. This is difficult to see even in good roentgenograms. It is seldom visible on the screen.

The term "duodenopyloric ulcer" is without meaning. An ulcer should be diagnosed as bulbar or gastric. In these two types there is a difference in the complications to be feared and the treatment indicated. To differentiate them, roentgenograms are necessary.

Ulcers of the lesser curvature are often so large as to be distinctly visible on the screen, but there are many which cannot be seen by roentgenoscopy.

Pyloric stenosis can be diagnosed by roentgenoscopy, but is revealed equally early by roentgenography. As soon as there is even a slight disturbance of evacuation, whether in the pylorus or the bulb, the pyloro-antral region assumes a peculiar appearance and shows exaggerated contractions with first transitory and then permanent infrapyloric distention toward the right. Even the stages of hyperkinesia and fatigue which are characteristic of Barrett's syndrome appear in roentgenograms made in series. Established stenosis can be demonstrated with ease both roentgenoscopically and roentgenographically.

To roentgenoscopy belongs, but not exclusively, the diagnosis of function. Lesional diagnosis is essentially roentgenographic. In the stomach which has been operated upon, roentgenoscopy shows how evacuation occurs and how the anastomosis functions. The diagnosis of perigastritis and gastrojejunitis, and especially of peptic ulcer, requires roentgenography. The results of medical treatment of ulcer may be determined from roentgenograms taken at given periods.

In cancer of the stomach, roentgenoscopy shows only the disturbance of evacuation or the beginning of incontinence, signs which are often late. Roentgenography, on the other hand, reveals irregularity of a curvature or a small pyloric niche. These findings should be supplemented by palpation under the screen. In this case, roentgenoscopy and roentgenography supplement each other. The study of the gastric mucosa must be made by roentgenography.

In non-calculous cholecystitis, the shape, fixity, and evacuation capacity of the gall bladder can be seen only in roentgenograms.

The diagnosis of periduodenitis is always difficult. When the bulb is drawn onto the lesser gastric curva-

ture and when the descending portion of the duodenum is stenosed, roentgenoscopic examination will give sufficient information. However, these conditions are not frequent. More often, the diagnosis must be made from very slight changes which can be detected only in a series of roentgenograms.

With the screen alone it is possible to see clearly large ulcers, most inoperable tumors, biloculations, stenoses, poses, aërophagy, and deformities such as diaphragmatic hernia or eventration. PAGE.

Mock, H. E.: Infective Granuloma; Non-Specific Chronic Tumor-Like Productive Inflammations of the Gastro-Intestinal Tract. *Surg., Gynec. & Obst.*, 1931, lii, 672.

Infective granuloma is far more frequent than the literature suggests. It is due directly to a low-grade infection causing impairment of the circulation or to impairment of the circulation followed by a low-grade infection. In either case there is an inflammatory reaction characterized by necrosis and a reparative process acting and reacting, with the gradual formation of an inflammatory mass. In some cases the granuloma may reach the size of a cocoon. Occasionally the reparative process predominates early in the condition, the granuloma then being of the constricting or stenosing type.

The nucleus for the formation of an infective granuloma may be an infection within the gastro-intestinal tract, such as appendicitis or diverticulitis; an ulcer in the stomach or intestine; or a foreign body in the bowel lumen, the wall of the bowel, or the abdominal cavity. Trauma is a frequent cause of the condition, especially trauma resulting in a tear of the mesentery, allowing foreign material to remain in the abdominal cavity, or producing a non-fatal perforation or laceration of the intestinal wall which is not recognized. Extraperitoneal inflammations may spread to or involve the gastro-intestinal tract in the granulomatous mass.

Infective granuloma is frequently diagnosed as carcinoma. It is probable that many cases of supposed inoperable carcinoma of the gastro-intestinal tract in which recovery has resulted were cases of granuloma. No tumor mass of the gastro-intestinal tract considered at operation to be malignant and inoperable should be abandoned without first removing a section for biopsy.

The etiology and the constancy of the symptoms of infective granuloma, the characteristic findings at operation, and the fact that a diagnosis can be made by histological examination warrant considering the condition as a definite disease entity. In the diagnosis of a tumor mass in the abdomen, the possibility of infective granuloma should always be considered. HOWARD A. MCKNIGHT, M.D.

Dragstedt, L. R.: Failure of Re-absorption of Gastric and Pancreatic Juice. *Am. J. Surg.*, 1931, xi, 544.

Dragstedt reports the results of experimental work on animals in which he removed all of the

gastric and pancreatic juice, thus preventing their normal re-absorption. The simple loss of gastric juice, which amounted to from 500 to 700 gm. in twenty-four hours, caused death in a few days. The outstanding changes were extreme hypochloræmia, severe alkalosis, and tissue dehydration. The animals were extremely depressed, lost weight, and suffered from urinary suppression. The blood showed an increase of non-protein and urea nitrogen. In spite of the profound dehydration, the animal would not drink. Neither would it eat. However, the intravenous injection of 0.9 per cent sodium-chloride solution or Ringer's solution in amounts of from 3 to 4 liters daily completely changed the picture. The animal showed improvement in its general condition and ate and drank, and the chemistry of the blood returned to normal.

Complete removal of the pancreatic juice resulted in a loss of from 500 to 1,400 c.c.m. in twenty-four hours. It was followed by blood changes somewhat opposite to those noted when the gastric juice was removed. The changes included a decrease in the concentration of the fixed base, a lesser decrease in chloride, a marked decrease in the carbon-dioxide combining power of the plasma, and acidosis. The animals became depressed and lost weight, and usually died after from five to six days from acidosis and dehydration. The intravenous administration of Ringer's solution or normal saline solution prolonged life and corrected the changes in the blood chemistry.

The findings of this study are of clinical importance in such conditions as acute dilatation of the stomach, paralytic ileus, and generalized peritonitis. In acute dilatation of the stomach and paralytic ileus the loss of gastric and pancreatic juices due to vomiting is sufficient to cause death unless it is checked. In generalized peritonitis the failure of motility of the gastro-intestinal tract to propel the gastric and pancreatic juices to the absorbing portion of the intestinal canal is a cause of the usual blood findings. MANUEL E. LICHTENSTEIN, M.D.

Horton, B. T.: Pyloric Block, with Special Reference to the Musculature, Myenteric Plexus, and Lymphatic Vessels. *Arch. Surg.*, 1931, xxii, 438.

The material used in this study was obtained from postmortem examinations at the Mayo Clinic.

The findings showed an almost complete separation between the circular muscle of the stomach and duodenum—an interruption of continuity of physiological significance, as Cannon expressed it—and a partial block of the gastric longitudinal fibers. The interruption of the circular muscle at the duodenopyloric juncture undoubtedly accounts for the block in peristaltic waves at the pylorus. The changes in tonus that are frequently observed in the duodenum, with the approach of the gastric waves are probably due to the spread of some influence along the myenteric plexus, along the narrow bridges of muscle connecting the stomach and duodenum, or both. The various elements of the myenteric

plexus form a continuous, although winding, chain from the stomach to the duodenum. If the gastric waves were not blocked at the pylorus, but traveled on down the duodenum, even a short distance, duodenal ulcer would probably be much less common.

In the distal portion of the pyloric canal, where most of the longitudinal fibers dip into the circular muscle to form the dilator muscles of the pylorus, the anatomical arrangement of the fibers suggests that they must act as dilators of the pylorus. The marked hypertrophy of these fibers unassociated with hypertrophy of the circulatory fibers which is observed in annular carcinomata of the pyloric canal with partial obstruction to the pyloric outlet tends to substantiate this view.

Carcinoma of the stomach rarely invades the duodenum. It apparently spreads easily in all directions in the walls of the stomach. Frequently it extends up to the pyloric ring, but at the pyloric ring it seems to stop abruptly. Even in advanced cases, the duodenum may remain free. It is well known that carcinoma usually spreads by direct extension or by way of the lymphatics. Several theories have been advanced to explain the immunity of the duodenum. It has been attributed to scarcity of lymphatic vessels communicating between the two organs, to the upward flow of lymph from the duodenum to the stomach, to the alkalinity of the duodenal contents, and to the obliteration of tissue spaces by spasmodic contraction of the pyloric sphincter to form a mechanical obstruction to the advance of the carcinoma. Horton discusses the lymphatic drainage of the stomach, the relationship between the lymphatics of the stomach and duodenum, and the bearing of these factors on the problem.

In the investigation reported, only normal specimens were used. A modification of Gerota's method was employed. In none of the specimens was there any demonstrable continuity between the submucous lymphatics of the stomach and those of the duodenum. An indirect communication between the submucous lymphatics of the stomach and those of the duodenum has been demonstrated. In two specimens there was a direct communication between the pylorus and a lymph node at the hilus of the liver. The drainage of the stomach is represented by four distinct areas, the largest of which is the area drained by lymph nodes along the lesser curvature. The second most important is that on the greater curvature, which drains into the inferior gastric and subpyloric groups of lymph nodes. The third drains toward the splenic group of nodes, and the fourth drains the distal portion of the pars pylorica to the nodes above the pancreas.

Magnant: A Case of Perforation of an Ulcer of the Stomach After Contusion of the Abdominal Wall (Sur un cas de perforation d'ulcère de l'estomac après contusion de la paroi abdominale). *Bull. et mém. Soc. nat. de chir.*, 1931, lviii, 357.

The literature records only nine cases of perforation of an ulcer of the stomach after contusion of

the abdominal wall. The author reports a case in which such a perforation was caused by a blow in the epigastric region from the shaft of a cart. He emphasizes the importance of determining the patient's gastric history in all cases of abdominal contusion since in this case a history of previous gastric disturbances prevented the erroneous diagnosis of rupture of the intestines.

Between the time of the accident and the beginning of the pain there was an interval of freedom from symptoms. According to Grégoire, the pain is caused by the peritoneal reaction and not by the rupture of the ulcer *per se* or the first contact of the gastric contents with the peritoneum. Magnant believes that the free interval in his case was due to an anterior perigastritis around an old callous ulcer which arrested the outflow of the gastric contents for a time; that the perforation was produced, so to speak, in two stages. He attributes the terminal anuria to a toxic nephritis which was manifested by cylinders and albumin appearing in the urine.

To determine what happens to the stomach when a sudden blow is sustained in the epigastric region, Magnant made studies with the fluoroscopic screen. The screen shows clearly the respiratory movements of ascent and descent of the dark biconvex line formed by the dome of the diaphragm above the gastric air bubble. When the epigastric region is suddenly percussed the diaphragm becomes momentarily arrested and then takes the position of forced inspiration whatever its position (inspiration or expiration) at the moment of the percussion. If the blow is sustained when the diaphragm is in the high expiratory position, the diaphragm descends suddenly to block itself for a second during inspiration. At the same time the abdominal wall is violently contracted and the stomach is pushed back and temporarily compressed in a semi-rigid frame formed by the dome of the diaphragm and the liver above, the mesocolon below, and the contracted walls of the abdomen in front and back. As the result of these changes and the contraction of the gastric walls, the gases and fluids within the stomach are forced with violence against the gastric wall.

PACE.

Bell, F. G.: Secondary Peptic Ulcer. *J. College Surg. Australasia*, 1931, iii, 331.

Estimates of the incidence of secondary peptic ulcer vary from 1.6 to 36 per cent. The true incidence is probably between these extremes. As the presence of a secondary peptic ulcer is often merely suspected on the basis of clinical or roentgen evidence and not verified by operation, an accurate estimate is impossible.

Bell reports eight cases of secondary peptic ulcer. In two, the length of time between the operation and the development of the ulcer was five and thirteen years respectively.

Jejunal ulcers show a greater tendency to perforate than marginal ulcers. However, chronic marginal ulcers may perforate into the transverse colon.

There seems to be no relationship between the type of suture material used and the occurrence of secondary peptic ulcer, since in the cases primarily operated upon by the author only catgut was used and there were no unabsorbable sutures. It appears also that the type of operation is not responsible since all techniques have been followed by secondary ulcers. The most important single factor is believed to be the type of patient. This is indicated by the fact that patients who have followed instructions in every detail may develop a secondary peptic ulcer whereas others who have done as they pleased may obtain satisfactory results. The poor results obtained following gastrojejunostomy for gastric ulcer led the author to abandon this procedure in favor of partial gastrectomy.

Operations for the relief of secondary ulcers are difficult because of the adhesions of the colon and the shortening of the mesentery. In none of the cases reviewed was there a perforation of the colon. Of the two patients with perforated jejunal ulcers, one died after local repair. The other has had suspicious symptoms since an operation in which the jejunal area was resected and a new gastrojejunostomy was established. In a case of marginal ulcer following partial gastric exclusion the anastomosis was undone, the jejunal portion resected, and the stomach restored by circular suture, the condition of the site of the primary ulcer having been found satisfactory. To date, the patient has remained in good condition. The other patients of the series were treated by partial gastrectomy, usually of the long loop, antecolic Polya type without entero-anastomosis. The jejunum was restored by transverse suturing. The entero-anastomosis was omitted in order to protect the suture line from the action of the hydrochloric acid by allowing direct access of bile and pancreatic secretions to the stomach. Omission of the entero-anastomosis calls for special care in the closure of the duodenal stump.

E. S. PLATT, M.D.

Hertel: The Causes of Failures After Resection of the Stomach for Gastroduodenal Ulcer (Ueber die Ursachen von Misserfolgen nach der Magenresektion wegen Ulcus gastroduodenale). *Zentralbl. f. Chir.*, 1930, p. 3176.

Only a few (according to Starlinger, fewer than 1 per cent) of the unfavorable results following resection of the stomach are due to recurrence of the ulcer or the development of jejunal ulcer. In some cases inflammatory changes of the residual gastric mucous membrane are responsible. Hertel directly demonstrated such a gastritis with the gastroscope and noted its association with characteristic postoperative symptoms which are different from those depending on the reduced size of the stomach.

Postoperative adhesions are absent in only 13 per cent of cases in which an operation has been performed on the stomach, and it is still uncertain whether they are able, without marked mechanical disturbances, to produce a disease picture which can

be considered an entity. From improvement in methods of diagnosis and increase in our knowledge regarding the surgically treated stomach, the diagnosis "adhesion symptoms" will become less frequent.

Also mentioned among postoperative complications are spastic states of contraction with disturbances of emptying at the anastomosis or in the region of the efferent loop of gut which may be of a periodical nature and suggest chronic or late vicious circle or intermittent incarceration or invagination. In addition, chronic pancreatitis or pancreatic disturbances must be considered after gastric resections with blind closure of the duodenum.

The possibility that the resection itself is the source of the symptoms must also be borne in mind as we know that the resulting deficiency of hydrochloric acid is followed by interference with the effects of ferments and consequent impairment of gastric digestion. While a certain compensatory balance and adaptation occurs, the gastro-intestinal canal always remains injured to a certain degree after resection. It is therefore surprising how well most patients get along after the operation. It is always to be expected that in some cases the entire organism will be injured in the course of time. At any rate, because of the marked physiological change in the digestive tract that is brought about by gastric resection, the symptoms complained of by some patients must not be immediately attributed to hysteria or neurasthenia as such a neurosis may have its origin in the altered organic function. In general, it may be said that the results of resection of the stomach will be less favorable the slighter the pathologic-anatomical findings at the first operation. In other words, a patient suffering from a callous ulcer is so greatly relieved by gastric resection that he gladly suffers the postoperative disadvantages and believes himself cured, whereas in a case with slight objective findings an operation gives new impulses to a pre-existing neurosis through the organic changes it produces.

In the discussion of this report, FRIEDEMANN-LANGENDREER, who had made several hundred follow-up examinations of the 1,500 patients whom he had treated by resection for ulcer, classified patients with postoperative symptoms into 3 groups: (1) those with true or pseudorecurrences of ulcer, including peptic ulcers of the jejunum, (2) those with roentgenologically demonstrable stasis due to a too narrow gastric exit, too precipitate emptying, insufficient utilization of food due to poor pancreatic function, demonstrable adhesions causing relative ileus, or the gastritis described by Hertel, and (3) those with indefinite symptoms in whom no cause can be found. True or pseudorecurrences can be prevented with considerable certainty if the entire antrum, including the pylorus and a sufficiently large portion of the duodenum, is removed. The patients with postoperative symptoms for which no cause can be found are usually nervous and apathetic persons without will power for health and work.

BODE (Z).

Fruchaud and Peignaux: Six Cases of Acute Intestinal Intussusception in Nurslings Treated by Barium Enema under Control of the X-Ray. Four Supplementary Interventions and Six Cures (Six cas d'intussusception intestinale aiguë des nourrissons traités par lavement baryté sous le contrôle des rayons X. Quatre interventions supplémentaires, six guérisons). *Bull. et mém. Soc. nat. de chir.*, 1931, lvi, 95.

The authors believe that in acute intussusception occurring in infants treatment by barium enema is especially desirable because the condition is only exceptionally caused by a tumor or Meckel's diverticulum, the rapid development of the symptoms (colic, vomiting, and blood in the stools) usually leads to a diagnosis before gangrene occurs, and laparotomy is of considerable gravity even when the general condition is good.

Over a three-year period they have subjected all infants with acute intussusception to this treatment. To the eight cases which they reported previously they are now able to add six others in which they used the barium enema, making a total of fourteen. In nine cases a complete cure was obtained with the barium enema alone. In four, a supplementary laparotomy was done. The one death occurred in a case in which the roentgen findings were interpreted incorrectly and the patient was moribund when subjected to operation. The six recent cases are reported in detail.

In the technique for the barium enema used by the authors the child is placed flat on its back on the X-ray table and, without an anæsthetic, the enema is given under gentle pressure continuously and with the vessel containing the barium solution elevated from 50 cm. to 1 meter above the table. The injection takes from five to ten minutes.

The authors emphasize that the surgeon should watch the administration of the enema, and that the enema treatment should not be given unless operation can be done at once if necessary.

Failure of the enema treatment is attributed to the anatomical type of the invagination and the degree of constriction of the invaginated intestine. The authors warn against excessive pressure as it may cause rupture of the intestinal wall.

JAMES B. MASON, M.D.

Hertel, E.: The Causes of Postoperative Jejunal Ulcer (Die Entstehungsurachen des postoperativen Jejunalgeschwurs). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1930, xlii, 57.

Hertel reports nine cases of postoperative peptic ulcer of the jejunum. Seven of the patients were males. In most of the cases an anterior gastro-enterostomy had been done. In all, the ulcer was found near the anastomosis. Penetration had occurred in 66.6 per cent. Conservative treatment is useless; only operation holds out a promise of success. The author reviews experiments on the production of peptic ulcer of the jejunum which have been recorded in the literature and describes some of his own. The latter are summarized as follows:

Series 1. Resection after a Billroth II operation. Following an invagination of the efferent loop of the small bowel, a fresh ulcer in the middle of the anastomosed bowel, an abscess of the adjacent omentum, and a chronic ulcer at the border caused by a silk suture were found.

Series 2. Resection after a Billroth II operation with entero-anastomosis. Localized mucosal inflammation was found in the region of the intestinal mucosa.

The theories as to the origin of peptic ulcer of the jejunum are the biochemical theory, the mechanofunctional and traumatic theory, the spasmogenic theory, the vascular theory, and the infectious and inflammatory theory.

BIOCHEMICAL THEORY

The portion of the small bowel used for the entero-anastomosis is not accustomed to the acid chyme as neutralization normally occurs in the duodenum. The lower segments of bowel are less resistant to the hydrochloric acid of the digestive mixture. In the stomach, the ingestion of food sets up a temporary protection against autodigestion. The protective powers are in reciprocal relation to the physiological digestive processes which vary in place and time. The pyloric region is an acid stimulator which stimulates the fundus to increased gastric juice production by a nervous mechanism (second gastric secretion phase). The antrum function is reduced when the antrum is unburdened by gastro-enterostomy and disappears when radical extirpation of the antrum is done. The impulse to stimulate the secondary secretory phase is increased by unilateral exclusion of the pylorus. In addition, the entrance of certain food substances sets up reflex influences of a chemical nature from the duodenum which reduce the quantity of juice and the acidity and digestive properties according to the method of operation, thereby changing the acidity relations of the stomach. The hydrochloric acid production of the second phase does not always coincide chronologically with the digestive function of the stomach which has been operated upon as the food may leave the stomach very rapidly, before the secretory curve is ended. These juices secreted by the empty stomach are particularly injurious.

Not only the action of hydrochloric acid is important, but also that of the duodenal juices as the latter contain the pancreatic ferment, trypsin, which also splits protein. Already in the stomach, first in the region of the anastomosis, reaction conditions prevail which are favorable for activation of the tryptic ferments. From time to time tryptic ferments which are activated but not combined with protein and have an especially high digestive action flow over the anastomosis. Operations which leave a blind pocket are associated with the additional danger that powerful tryptic digestive secretions may be retained, whereby their digestive action is increased. These tryptic components must be considered as well as the peptic components.

When gastro-enterostomy is done the second hydrochloric acid production phase is diminished. However, the reduction of acidity persists for only a short time. Later, the acid levels are often increased. When an anterior gastro-enterostomy is done the conditions are more unfavorable because of the entero-anastomosis. The duodenal juices then flow immediately into the efferent loop without being mixed with gastric juice at the anastomosis. As a result, a greater tendency toward secondary ulcer formation is perhaps produced. After a von Eiselsberg exclusion of the pylorus, peptic ulcer of the jejunum occurs very frequently. Acid secretion is considerably increased. Moreover, there is an empty stomach secretion, and tryptic digestive juices are active. Inhibitory reflexes from the duodenum are absent. After gastric resection there is absence of the entire second chemical phase because of loss of the antrum. Moreover, the inhibitory reflexes from the duodenum are absent, and the acid-producing gastric mucosa is reduced.

The ulcers observed after the Billroth I operation are not secondary ulcers, but suture recurrences. However, in exceptional cases there are recurrent, postoperative ulcers which are probably produced by the tryptic ferments. When a Y gastro-enterostomy is done not all of the transpyloric secretions come into contact with the anastomosis and there is absence of neutralization in the anastomosis. The radical methods have the advantage that not only the ulcer-bearing and ulcer-favoring portion of the stomach is extirpated with the antrum, but also the second phase of hydrochloric acid production disappears. The result is a lowering of the acid levels.

From these facts it is evident that there is a certain dependence of the ulcer tendency upon the secretory conditions. The accessory rôle of an unphysiological action of the chyme is thereby demonstrated. However, other factors must be considered also, as the ulcers are only circumscribed lesions whereas the chemical insults are directed against the entire anastomosed bowel.

MECHANOFUNCTIONAL AND TRAUMATIC THEORY

The spur-like portion of bowel wall opposite the anastomosis acts as a bar against which the food residue impinges. This portion of intestine is not accustomed to such undigested masses. The constantly repeated mechanical irritation accounts for the shape of the ulcer. The operative trauma plays no great rôle. However, the anastomotic ring is to be regarded as an area of diminished resistance where inflammatory processes take place. Unabsorbable suture material is blamed.

SPASMOGENIC THEORY

Invaginations of the efferent loops have been found. Previous stages of intermittent character must also be considered. Spastic contraction states occur in the anastomotic bowel. It depends on their nature, duration, and intensity whether they will

lead to gastro-intestinal obstruction, intermittent chronic or acute invagination, or an ulcer at the site of the anastomosis. The ulcer is the result of a local spasm.

VASCULAR THEORY

In the mesenteric segment belonging to the anastomotic bowel vascular damage leading to thrombosis or stasis in the blood vessels may be produced by operative displacement, rotation, traction, or crushing.

INFECTIOUS AND INFLAMMATORY THEORY

There are certainly relationships between local infections and the formation of postoperative peptic ulcers of the jejunum. Suturing is followed by the formation, in the intestinal wall, of minute, circumscribed abscesses which may penetrate toward the mucosa. The result is an inflammatory traumatic ulcer which is maintained by the biochemical action and the silk sutures. Accordingly, the tendency toward secondary ulcer formation is dependent upon factors which may be considered unfavorable in a biochemical sense. Chief among the latter are abnormal conditions which increase the activity of the digestive juices—an increase in hydrochloric acid production, a disturbance in the relationships of the physiological digestive processes. The discrepancy between the rapid emptying through the anastomosis and the secretion of gastric juice results in unchecked action of uncombined digestive juices upon the intestinal wall. In addition, there is the disturbance of neutralizing processes after the anastomosis. The acid secretion of the stomach and the alkaline secretion of the duodenum are not intermixed in the transpyloric region. Therefore each is uncombined and possesses special digestive power. The more important of the two is the gastric juice. The tryptic component, however, plays a rôle. In the presence of highly digestive juices relatively slight injury of the wall is sufficient for the development of an ulcer, whereas in the presence of less powerful digestants a correspondingly more severe trauma is necessary.

To account for the damage to the wall at the anastomosis, several possibilities are suggested. Locally circumscribed spastic contractions occur which interfere with circulation. Vascular changes, stasis, thrombosis of the corresponding mesenteric segments are added. The anastomotic margin is and remains an area which favors infection (stitch abscess, silk-suture ulcer). In addition, there are the mechanical changes at the anastomosis. It is not surprising, with the multiple possible combinations, that peptic ulcer of the jejunum fails to heal.

ERICH HEMPEL (Z).

Lockhart-Mummery, J. P., and Hodgson, H. G.: *Diverticula of the Colon and Their Sequelæ. Brit. M. J.*, 1937, 1, 525.

Diverticula are the most common pathological lesions of the colon. In the majority of cases they are formed in the pelvic colon. On account of the

arrangement of the rectal muscular fibers they do not occur in the rectum. After about the age of forty-five years the formation of diverticula is favored in certain persons by loss of tone of the muscularis. The loss of tone seems to be definitely associated with a tendency toward the deposit of excessive fat in the abdomen and elsewhere.

Röntgen examination plays an important rôle in the diagnosis and observation of the progress of the condition. The preferable technique is that in which the barium enema is used, but occasionally the barium must be given by mouth. The examination should be made in several planes. The authors examine their patients with the X-ray every six months.

Uninflamed diverticula may rupture into the peritoneal cavity spontaneously, but inflammation within the walls is most dangerous. The diverticula do not cause any symptoms as long as inflammatory complications are absent. They tend to increase in size and number in spite of treatment. Carcinoma occasionally follows suppurative diverticulitis, but the latter is not a common cause of carcinoma.

The treatment of diverticula of the colon is not well established. The best results have been obtained in cases in which the affected portion could be completely resected and the bowel joined again. Operations for diverticulitis are among the most difficult of surgical procedures, yet often give excellent results. Surgical treatment should not be delayed until a grave complication develops, but should be given in time to prevent such a complication.

EARL O. LATIMER, M.D.

Robertson, D. E.: Sympathectomy for Megalocolon. *Canadian M. Ass. J.*, 1931, xiv, 359.

Robertson reports three cases of congenital megalocolon or Hirschsprung's disease which were treated by operation on the lumbar sympathetic trunk. Previously, surgical treatment of this condition consisted of either a short-circuiting operation or the more radical total extirpation of the enlarged colon. These are grave operations and are not always completely successful.

Royle, who devised the operation for relief of spasticity of the lower extremities in cases of upper motor neurone lesions, found that the first patient subjected to the procedure was cured of severe constipation. Later he reported thirteen additional cases in which constipation was cured. Gaskell believes that the large bowel is innervated by both the sympathetic nervous system and the parasympathetic pelvic nerve. The pelvic nerve is thought to be concerned with the movements of the bowel, while the sympathetic nerves are believed to inhibit bowel action and control the sphincters of the bowel.

The first case reported by Robertson was that of a mentally deficient girl nine years of age who had had intractable constipation since infancy. Cathartics in large quantities had no effect, and the results of enemas were little better. It was not unusual for

the child to go one week without a bowel movement. She frequently complained of pain in the abdomen. Roentgen examination after a barium enema revealed an enormous colonic dilatation filling the entire pelvis and abdomen. No haustration was visible.

At operation performed September 23, 1927, under general anesthesia, an incision was made on the left side as for lumbar nephrectomy and a Royle incision was made from the level of the twelfth rib downward in line with the edge of the quadratus lumborum, across the lumbar triangle, and forward just below the crest of the ilium. The lumbar triangle was then defined and perforated. Division of the edge of the erector spinae muscles and downward division of the attachment of the external oblique were then done. The peritoneum was stripped from the posterior abdominal wall, across the psoas muscle, and over the anterior surface of the vertebrae. Along the anterior surface of the vertebrae the sympathetic cord was easily identified. The rami running from the medial surface of the cord were picked up and divided. The wound was closed by a running layer suture.

After the operation the patient had an involuntary bowel movement, and, with a daily enema, a regular movement occurred on all but two of thirty-nine successive days. The operation produced an immediate increase in the temperature of the left leg. The foot became, and has remained, dry. Two years after the operation, roentgenograms revealed a small ascending colon with marked haustral markings. The bowel movements have continued regular each day, and there has been marked improvement in the general health.

The second case reported was that of a girl nine years of age who had had constipation since birth and about every three weeks suffered an attack of nausea and vomiting, which were relieved by bowel movements. At operation performed September 14, 1929, under general anesthesia, a left lumbar sympathectomy was done, the second, third, and fourth lumbar spinal segments of the rami communicantes being sectioned. Recovery was uneventful. After the operation, bowel movements were most satisfactory. A roentgen examination made in March, 1931, showed the colon to be small and spastic. The increase in the temperature of the left foot which was caused by the operation has remained constant. The left foot has been warm when, during the winter, the right foot has been uncomfortably cold.

The third case reported was that of a woman twenty years of age who had been subjected to appendectomy for indefinite abdominal pain. The appendix was free from disease, but the large bowel was found larger and thicker walled than normal. Two years later a 2-ft. segment of the intestine was resected, but the symptoms were not relieved. At a third operation, more of the large bowel was removed, but after three months the abdominal pains recurred and the constipation was very obstinate.

Two years later a lump which formed in the left lower quadrant of the abdomen necessitated a fourth operation. At that time a movement of the bowels occurred only every third or fourth day. On March 17, 1930, bilateral sympathectomy was performed. The sympathetic cord was isolated and amputated from the level of the second to the fifth lumbar vertebrae. At the conclusion of the operation the left foot was definitely warmer than the right. During the first week after the operation there was no obvious change in the bowel movements, but thereafter improvement was rapid with daily enemas.

After submitting this article for publication the author added to it the report of three other cases of megacolon cured by sympathectomy. He believes that the lumbar sympathetic cord is approached most safely and easily by the extraperitoneal route.

JOHN W. NUZUM, M.D.

Hurst, A. F., Briggs, P. J., Dukes, C., Lockhart-Mummery, J. P., and Others: Discussion on Ulcerative Colitis. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 785.

HURST stated that he had had frequent opportunities to make sigmoidoscopic examinations in cases of dysentery. Amoebic dysentery presents quite a characteristic picture bearing no resemblance to that of ulcerative colitis, whereas the picture of bacillary dysentery is indistinguishable from the picture of ulcerative colitis. Flexner's bacillus dysenteriae may be obtained by scraping the base of the ulcer in the bowel through the sigmoidoscope. As the majority of cases of bacillary dysentery coming under observation in England are already in the chronic stage, it is easy to understand the impossibility of recovering the bacteria from the stools since it is well known that isolation of the bacillus from the stools in typical dysentery in the Tropics may be very difficult after the acute stage of the condition has passed. The fact that positive bacterial findings are found only in the early cases and the fact that many cases respond to specific treatment with anti-dysentery serum confirm the view that ulcerative colitis is a form of bacillary dysentery. Achlorhydria was present in about 25 per cent of Hurst's cases. Absence of the normal acid protective barrier of the stomach permits swallowed organisms in infected food and water to reach the intestines.

Among 693 cases of ulcerative colitis seen at the Mayo Clinic in the period from 1923 to 1928, the complications of the disease were as follows: adenomatous polyposis, 69 cases; stricture, 59 cases; perirectal abscess, 26 cases; perforation, 18 cases; malignant disease, 15 cases; and arthritis, 30 cases. These were the complications seen in Hurst's cases. As strictures may develop without a change in the symptoms, a barium enema should be given from time to time in chronic cases. In 3 of Hurst's cases, which would have been fatal if otherwise treated, complete recovery followed a short-circuiting opera-

tion. In 2 cases, cancer developed following polyp formation in the rectum on the basis of an ulcerative colitis. Anal infections are of great importance and tend to persist after the infection has healed.

Direct examination of the mucosa of the rectum, which is the part first involved and the last to heal, is essential for diagnosis and for guidance in treatment. A long proctoscope is easier to manipulate than a sigmoidoscope and has the advantage of bringing the mucosa nearer the eye, thereby facilitating examination of the anal canal, but Hurst has had several cases of carcinoma of the rectum and pelvic colon which were treated as cases of dysentery until an examination was made with the sigmoidoscope.

Essential parts of the treatment are rest in bed, warmth, and a generous mixed diet from which only the skins of fruit and the fibers of vegetables are excluded. When anemia is present, transfusion improves the general condition and hastens healing of the ulcerations. Charcoal may be employed to absorb the gas. Tannic acid is the most useful drug. It is given after preliminary lavage with normal saline solution through a soft catheter introduced just beyond the anus.

In early cases, and in an occasional late one, the use of polyvalent anti-dysentery serum has given results little short of miraculous. A young man, almost moribund, who had been ill a year and in whom no improvement followed appendicectomy, recovered completely in two weeks after the use of this serum. Five days after the first injection the sigmoidoscope showed that innumerable ulcers which had been present previously had vanished, and nine days later the appearance of the mucous membrane was absolutely normal. Hurst has never seen the slightest benefit follow any form of vaccination, and in some cases has noted definite aggravation of the local condition after such treatment.

The mortality of ulcerative colitis is low. Complete recovery may result after very long periods of treatment, but there is a tendency toward recurrence. Associated oral and pharyngeal infections and anal complications must be treated. Relapse may follow an acute sore throat. The patient should take sufficient paraffin oil to keep the stools soft. If hydrochloric acid is absent from the stomach, it should be supplied for the rest of the patient's life.

BRIGGS showed a series of lantern slides demonstrating the value of roentgenography in determining the extent of the disease.

DUKES discussed the pathology of ulcerative colitis. The condition begins as an acute inflammation of the mucous membrane of the colon which results in the formation of patches of localized necrosis followed by the separation of sloughs and superficial ulceration. In about 10 per cent of cases, ragged tags of polypoidal mucous membrane remain after the ulcers heal. These are not true adenomatous proliferations. Other complications of the healing process are stricture, cancer, and perforation.

Those who postulate a specific agent as the cause of the disease have failed to furnish a completely satisfactory explanation. The diplostreptococcus of Barga can be cultivated from the ulcers, but is found also in other types of ulceration and in the normal colon. The course of the experimental disease in rabbits following the intravenous inoculation of Barga's organism does not resemble that of ulcerative colitis in man. In rabbits, similar symptoms follow inoculations with other bacteria. Barga's diplostreptococcus and other types of faecal streptococci are probably secondary invaders, the ulceration being first brought about by some other agent.

LOCKHART-MUMMERY said that the great majority of cases of ulcerative colitis, apart from tropical dysentery, are due to infection of the mucosa of the colon by the streptococcus faecalis or viridans, and a few to the tubercle bacillus. The sigmoidoscope is a necessary adjunct to both the diagnosis and the treatment of the malady. He stated that appendicectomy is curative, provided it is performed early before the bowel has been severely damaged. At St. Mark's Hospital, London, appendicectomy is regarded as the one method that can always be relied upon.

The prevalent idea that this simple operation should be delayed until lavage and all forms of medical treatment have been tried is fundamentally wrong. The appendix should not be opened until the skin wound has healed, and the opening should not be closed until the patient has gone for a full year without treatment or recurrence. Perforation occurs in the early stages of the disease and is usually fatal. Stricture is a serious and late complication. Liver abscess, common in the amœbic type of dysentery, is rare in ulcerative dysentery.

TIDY stated that he was particularly interested in ulcerative dysentery during the late war when he was in a dysentery hospital. He believes that neither sigmoidoscopy nor operation is necessary in the treatment, and that morphine injections and a daily enema are contra-indicated. He has adopted 3 stages of treatment by rectum: (1) starch and opium, (2) colonic washes, and (3) in a late stage, medicated enemas. For the constipation he prefers paraffin oil.

HOBSON said that in advanced ulcerative colitis the roentgenogram reveals an entire absence of haustration.

POYNTON reported that he had suffered from ulcerative colitis while he was a student in 1893. His case had been reported in the *Lancet* as one of the first of recovery on record. He places most reliance in the treatment on skillful nursing, careful regulation of the diet, the administration of opium and bismuth by mouth, and opium enemata. He has found kaolin of great value.

GORDON-WATSON said that he always performs appendicectomy. He believes that it is impossible to treat the proximal colon adequately without it. He emphasized the importance of repeated blood trans-

fusions and irrigation through the appendix with barium-sulphate solution.

BURNFORD concluded from an experience with about 50 cases of ulcerative colitis that some cases are curable while others are not. He treats his cases by ionization. If after three weeks the patient is not doing well, he feels justified in calling in the surgeon to put the colon at rest.

RUSSELL discussed the various physical methods of treatment, such as ionization, diathermy, and colonic irrigation. JOHN W. NUTZ, M.D.

Devine, H. B.: Safer Colon Surgery. *Lancet*, 1931, ccxx, 627.

The author first describes his modification of the operation of Paul (exteriorization resection of the colon or ileum and colon). The operation as performed by Paul was followed by slow convalescence and a faecal fistula which required secondary closure. In the author's modification, the attempt is made to effect an early anastomosis and to avoid the unnecessarily large artificial anus comprising the open ends of both segments of bowel by forming a fistula which will be only large enough to subserve the required function and can be closed by a gradual method of repair carried out as a part of the daily dressings.

The early anastomosis is made by applying in the first twenty-four hours an enterotome with very generously bevelled edges and a narrow almost cutting edge. The bevelled edges make possible the application of a wide and graduated pressure which will produce broad anastomotic junctions. After from thirty-six to forty-eight hours, the narrow cutting surface of the clamp is brought into play by extra pressure, the gangrenous tissue is cut through, and the adjacent bowel is connected in from three to four days.

The control of the size of the fistula depends, first, on leaving outside of the abdominal wall, in the amputation of the diseased segment, enough of the ends of the intestinal segments to permit closure, and second, on getting rid of the redundancy by suturing all of the non-functioning end of the distal segment and part of the end of the proximal segment in the first forty-eight hours, before the chronic inflammation which is part of the process of natural healing makes the intestinal wall too rigid. In this way immediate and certain union is obtained and a small manageable fistula like a cœcostomy is left. After from eight to ten days the gut is painless and can be sutured, without the administration of an anæsthetic, as part of the daily dressing. The suturing is done as soon as the fistula has fulfilled its purpose and while the intestinal wall is still somewhat flexible. As eversion or prolapse of the mucous membrane interferes with or may prevent the healing of the intestinal wound, the mucous membrane is freely amputated.

Devine describes in detail also his method of doing a colectomy and an ileocollectomy.

JOHN J. MALONEY, M.D.

Florini, E.: Histological Changes Found in the Colon Removed Surgically in Cases of Habitual Constipation (Sulle alterazioni istologiche riscontrate nell'intestino colon asportato chirurgicamente nei casi di stipsi abituale). *Arch. ital. di chir.*, 1937, xxviii, 401.

The author reviews twenty-three clinical cases of habitual constipation and reports the findings of experiments on rabbits in which constipation of varying severity was brought about artificially. The histological changes in the colon are described in detail and shown by photomicrographs. In the mucosa there were changes in the epithelium in the form of mucous swelling and flattening, malformation, and desquamation of the cells. The intestinal glands showed atrophy and rarefaction, and the reticulate tissue showed proliferation, enlargement of its meshes, and infiltration by lymphocytes, leucocytes, polynuclear leucocytes, and plasma cells. The solitary lymphatic follicles were enlarged. In the muscularis mucosæ in some cases there was hypertrophy of the muscle elements with small-cell infiltration between them. In the submucosa there was enlargement of the connective tissue fibers with congestion of the small vessels. The muscle layer frequently showed hypertrophy and hyperplasia of the fibers and in a few cases substitution of the fibers by connective tissue. The thickness of the serosa and subserosa was increased. Auerbach's plexus was less well developed than normal and not in proportion to the increased thickness of the muscularis. In some cases it was abnormal in shape and showed substitution of connective tissue for the nerve elements. The elastic tissue was poorly developed, particularly in proportion to the thickness of the muscularis. In some cases it was absent or irregular in arrangement.

These are the changes of chronic inflammation. The author believes that the difference between functional and organic constipation is only chronological. Functional constipation becomes organic when the anatomical changes described take place. It is possible that the changes in the mucosa cause interference with the transmission of nerve stimuli from Auerbach's plexus, and that the hypertrophy and hyperplasia of the muscles is an attempt at compensation. When more or less advanced atrophy of the mucosa and nerve elements has taken place, restoration to normal can hardly be hoped for and surgical removal of the diseased segment of the intestine removes an obstacle to the passage of feces. The results of surgical operation have shown that such a segment is useless and even harmful. When cases of truly organic constipation can be differentiated from those of functional constipation, surgical operation will give much better results than it has yielded heretofore. AUDREY G. MORGAN, M.D.

Balestra, G.: The Erect Cæcum (Sul ceco eretto). *Radiol. med.*, 1937, xviii, 161.

The author studied ten cases of inversion of the cæcum with the roentgen ray. The base of the

cæcum was directed upward in an anterior, posterior, lateral, or medial direction. It was found in the subhepatic, iliac, and pelvic regions. In none of the cases did the flexion of the cæcum cause obstruction.

The subjective symptoms consisted of attacks of dull continuous pain or frequent colics in the right iliac region and mild dyspeptic symptoms such as belching, bloating, and a sense of weight in the epigastrium. The only constant objective finding was deep tenderness in the right iliac fossa.

Surgical intervention in seven cases showed that the abnormal position of the cæcum was maintained by periappendiceal, pericæcal, or pericolic adhesions or bands. The adhesions were divided and the cæcum replaced and fixed in its normal position. The four patients who were traced after the operation reported that their abdominal distress had been completely relieved.

In the author's opinion, the inverted cæcum is an abnormally mobile cæcum which has become fixed in its abnormal position as the result of a prenatal or postnatal pathological process. Incomplete descent or abnormal rotation of the cæcum is not a factor. Malpositions differ from incomplete or abnormal rotation of the cæcum by the absence in the former of changes in the length and position of other segments of the colon, particularly the ascending colon which tends to be abnormally mobile. This differentiation is important when surgical intervention is considered.

The only means of making a diagnosis of inverted cæcum is roentgen examination.

PETER A. ROSI, M.D.

Tasche, L. W., and Spano, J. P.: An Analysis of 700 Consecutive Appendectomies. *Ann. Surg.*, 1931, xciii, 899.

In the period from 1920 to 1925 the incidence of appendicitis increased from 11 to 14.4 per 100,000 population. In the United States, about 20,000 persons die from the condition each year. Appendicitis occurs with equal frequency in males and females.

Of the acute cases reviewed by the authors, 60.9 per cent were those of males, whereas of the chronic or interval cases, 61.4 per cent were those of females. In 75 per cent of the cases the condition occurred during the second or third decade of life. The average age of the patients was twenty-one and nine-tenths years. Appendicitis is most common in the summer months, possibly because of the increased prevalence of gastro-intestinal disorders in the summer. In 5.8 per cent of the cases reviewed there was a history of recent infection. The most common preceding conditions were colds, sore throat, and tonsillitis. Recent or simultaneous infections were more frequent in children than in adults. More than half of the patients had had previous attacks of appendicitis, and many of them were referred during an interval between attacks.

The cases were classified clinically as mild, moderate, severe, and very severe. Pathologically, they were grouped into the following 4 classes: (1)

those with no evidence of active inflammation, (2) those of recurrent appendicitis in which previous infection was evidenced by perivascular collections of lymphocytes in the serosa, (3) those of acute suppurative appendicitis, and (4) those of "obliterated appendix."

The most satisfactory classification was found to be the surgical-pathological. According to this classification, the cases were divided into the following 5 groups:

1. Appendicitis without suppuration. *a.* Chronic appendicitis. This group included all cases with a definite history of appendicitis and many which should be classified as cases of acute or subacute subsiding appendicitis because tenderness was present over McBurney's point. In 339 interval cases there was 1 death, a mortality of 0.3 per cent. The patient who died was an obese woman whose appendix was located under the liver and whose caecum had not descended normally. Her death resulted from paralytic ileus which was attributed to the prolonged exploration necessary at the time of operation. *b.* Acute appendicitis. There were 361 cases in this group with a mortality of 6.4 per cent.

2. Acute suppurative appendicitis. The 72 cases in this group included all cases of suppuration in which there was no peritoneal involvement or abscess formation. The mortality was 1.4 per cent.

3. Acute appendicitis with local peritonitis. In this group there were 156 cases with a mortality of 2.5 per cent.

4. Acute appendicitis with abscess. This group included 112 cases with a mortality of 9.7 per cent.

5. Acute appendicitis with diffuse peritonitis. In 21 cases in this group there were 8 deaths, a mortality of 38 per cent.

The total mortality was 3.4 per cent. Nineteen of the 24 deaths were those of males. The largest number of deaths occurred in the cases of children and aged patients. The high mortality is attributed to delay of operation. In certain cases the clinical picture may be very misleading. In such cases the policy of immediate operation is of particular importance. As the increase of leucocytes is a protective function, the presence of a leucopenia usually indicates poor resistance. In the cases of children and in cases with diffuse peritonitis, the pulse and temperature are usually higher than in other cases. In most cases they are only slightly increased.

The presence of white and red blood cells in the urine was noted in 28 of the cases reviewed. These findings are probably due to the action of toxins of the kidneys, extension of an abscess to the kidney, the development of ureteritis following contact of the ureter with the inflamed appendix, or the development of cystitis in association with a pelvic abscess.

In conclusion the authors state that the greatest chance of reducing the mortality of acute appendicitis lies in early diagnosis followed by immediate appendectomy.

E. S. PLATT, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Linton, R. R.: The Relation of Calcium to the Haemorrhagic Tendency in Obstructive Jaundice. *Ann. Surg.*, 1931, xciii, 707.

A haemorrhagic tendency complicating obstructive jaundice has long been recognized. As most authorities have considered it closely related to the availability of calcium in the blood stream, the author made a laboratory and clinical study of the blood calcium.

The laboratory work was done on cats as the normal blood calcium in these animals (from 9.0 to 11.0 mgm. per 100 c.cm.) is essentially the same as the normal blood calcium in man.

The obstructive jaundice was produced by ligating and dividing the common bile duct. Calcium determinations were made by the Tisdall modification of the Kramer-Tisdall method both before and after the production of the jaundice. The degree of jaundice was determined by the quantitative van den Bergh test. The animals lived a maximum of three or four weeks after the experiments.

It was found that marked obstructive jaundice lasting as long as three weeks did not affect the blood-calcium level. The blood calcium was not accumulated with the bile pigments nor was it decreased by increased excretion.

The clinical studies were made in a series of cases of obstructive jaundice treated at the Massachusetts General Hospital. The author does not agree with the conclusion of Vincent and Walters that, *in vitro*, the addition of a few drops of 1 per cent calcium chloride shortens the coagulation time. Of twenty-three of Linton's tests in which the blood was treated with calcium chloride, the time was longer than in untreated blood in seventeen and shorter in only six.

Of forty patients with obstructive jaundice, most of whom were operated upon within the last two years, twenty-three received pre-operative preparation with two or more injections of 5 or 10 per cent calcium chloride while seventeen received no calcium chloride. Bleeding occurred in fifteen (65 per cent) of the former and in only four (23 per cent) of the latter. The two groups were practically the same as regards the degree and duration of the jaundice and the operations on the biliary system. In a number of cases of postoperative bleeding in which calcium was used, the results were negative.

Calcium-chloride therapy showed no effect on the sedimentation rate in five cases in which the test was made before and after the treatment. Patients with a slow or normal sedimentation rate did not bleed, while those with a rapid rate were apt to bleed.

In the author's opinion, the theory that the bile pigments unite with available calcium in the blood stream, thereby changing it to a form which is unusable in the process of coagulation, has not been satisfactorily proved.

Linton draws the following conclusions from the study reported:

1. The administration of calcium in obstructive jaundice for the prevention of postoperative hæmorrhage has no theoretical or practical basis.

2. The lowered coagulability of the blood in cases of obstructive jaundice does not seem to be due to a deficiency or an abnormality of the blood calcium.

3. The most effective means of preventing and stopping postoperative hæmorrhage in obstructive jaundice is repeated direct blood transfusion supplemented by a high carbohydrate and fluid intake before and after operation.

L. ENWROTH BOVIK, M.D.

Fowler, R. S.: Cholecystectomy Without Drainage. *Ann. Surg.*, 1931, xciii, 745.

Fowler omitted drainage in 240 cases in which cholecystectomy was done. One hundred and ninety-four of the patients were females. Adhesions were present in all cases. They varied from slight adhesions of the ampulla to the duodenum to extensive adhesions involving the fundus of the gall bladder in addition. Stones were present in about half of the cases.

Eight of the patients died. Seventeen have not reported since they were discharged from the hospital. One hundred and ninety-six have been well for periods ranging from three months to eight years after the operation. Nineteen reported symptoms of one kind or another from three months to seven years after the operation.

Wound infection seemed to be at least as common with drainage as without it.

As in the 240 cases reviewed the mortality was greater than in a very much larger series of more serious cases in which drainage was established and the incidence of cure was considerably lower than in cases with drainage, Fowler concludes that it is wiser to drain than not to drain. SAMUEL KAHN, M.D.

Waugh, G. E.: Transplantation of an External Biliary Fistulous Tract into the Duodenum. *Brit. J. Surg.*, 1931, xviii, 581.

The case reported was that of a man seventy-three years of age who had had an operation for gangrene of the gall bladder one year previously. The wound had never healed, and a complete external biliary fistula had formed. The stools were clay-colored, and the urine contained only a faint trace of pigment.

At operation, the previous operative site was found to be involved by a mass of dense fibrous tissue. When the fistulous tract was excised down to its origin it was seen to be attached to the right hepatic duct. No evidence of the common duct was discovered. The distal part of the fistula was anastomosed to the duodenum without difficulty.

The patient made an easy convalescence, and by the fifth day the stools were pigmented. Eight months later the patient was reported well.

STANLEY H. MENTZER, M.D.

MISCELLANEOUS

Chiray, M., Benda, R., and Lomon, A.: Acquired Non-Traumatic Hernia of the Stomach Through the (Esophageal Orifice of the Diaphragm. Symptoms and Pathogenesis (La hernie acquise non-traumatique de l'estomac à travers l'orifice œsophagien du diaphragme. Symptômes et pathogénie). *Presse méd.*, Par., 1930, xxxviii, 1601.

Diaphragmatic hernia is not as rare as was believed before roentgen studies were made routinely in cases of chest conditions. Between the old statistics of Béchère and the more recent statistics of MacMillan and others as to its incidence there is a wide difference. In 1926, Pancoast and Boles discovered 16 diaphragmatic hernia among 9,000 patients examined. All but 1 were non-traumatic.

A distinction must be made between non-traumatic congenital hernia and traumatic hernia. The latter occur through the lateral, fleshy portions of the dome of the diaphragm, at weak points or the sites of congenital defects, whereas the former occur through one of the natural orifices in the central portion of the diaphragm.

The symptoms of non-traumatic diaphragmatic hernia are quite complex and often indefinite. The condition may remain latent, but epigastric pain is common. The pain may occur immediately or some time after the ingestion of food or only at night, when the patient is lying down. Nausea, somnolence, and vertigo are not uncommon. Constipation is usually present, but may be interrupted by attacks of diarrhoea. Hæmatemesis is common. Rapid loss of weight is very constant.

In some cases the symptoms may be entirely thoracic, consisting of dyspnoea, choking sensations, precordial pain, and pain elsewhere in the chest. As the condition occurs in elderly persons, myocarditis or aortitis are apt to be suspected. The physical signs are confusing and variable. Frequently a diagnosis of pleurisy or hydropneumothorax is made.

In still another group of cases, abdominal and thoracic symptoms are combined.

The authors report a case which was under observation continuously for seven years. The patient was a man sixty-seven years old, who, while apparently in perfect health, was taken suddenly with a violent attack of coughing and hæmoptysis. On physical examination a few râles in the bases of both lungs and an aortic blow were noted. The blood pressure was 180/100. The liver was slightly enlarged and tender. Examination of the blood showed slight uræmia. There was some nocturia. A diagnosis of arteriosclerosis with aortitis and slight cardiac and renal decompensation was made. This diagnosis seemed to be confirmed by a widening of the mediastinal shadow noted on fluoroscopic examination and by attacks of dyspnoea and cough which occurred during the subsequent three years when the patient was lying down. The symptoms were relieved by cardiac medication.

Later the hæmorrhages recurred, together with symptoms pointing to the stomach—a loss of weight and crises of epigastric pain and nausea which terminated in vomiting. The crises recurred from time to time. Cancer of the stomach being suspected, the patient was examined again with the X-ray. Hernia of the stomach was then discovered. The symptoms subsided under the influence of antispasmodics and frequent small feedings. Eight months later there was a new hæmorrhage which had all the characteristics of hæmatemesis and lasted three days. Hæmorrhages of less severity together with attacks of pain have recurred up to the present time. The advanced age of the patient and the arteriosclerotic condition make operation inadvisable.

Roentgen examination is indispensable to the diagnosis of diaphragmatic hernia and has served to explain the mechanism of its production.

The antral portion of the greater curvature of the stomach rotates upward, molds itself against the dome of the diaphragm, and becomes engaged in the œsophageal hiatus. As the proximal and distal portions of the stomach are fixed, the organ presents the form of an inverted U. This is only an exaggeration of the normal position of the organ which,

when viewed from the side, is nearly horizontal. The greater curvature being pushed up by the dilated intestines, this portion rather than the fundus fills with air and, being thin and supple, is easily drawn into the œsophageal hiatus by the negative pressure of the thorax. In the authors' case the stomach was pushed up by an unusually large colon. The influence of the negative pressure of the thorax is so marked that in operating on one of their patients the authors saw the stomach reduce itself, as it was freed from adhesions, simply as a result of the opening of the thorax and the creation of a pneumothorax.

The gastric pouch is situated in the posterior mediastinum behind the heart. Ordinarily it contains only air. When the patient is horizontal it fills with barium secondarily from the fundus.

Occasionally the gastrophrenic ligament gradually relaxes and the stomach comes, in great part, to occupy the thorax. A case is cited in which the entire stomach occupied the thorax, but under the weight of food became partially reduced, the fundus returning to the abdomen.

The authors believe that in all cases the herniation begins with engagement of the greater curvature in the œsophageal hiatus. ALBERT F. DEGRAFF, M.D.

GYNECOLOGY

UTERUS

Meshberg, P.: An Analysis of 128 Interposition Operations. *Am. J. Obst. & Gynec.*, 1931, xxi, 398.

This article is based on 128 interposition operations for prolapse of the uterus performed at the Mt. Sinai Hospital, Philadelphia. The youngest patient was twenty-four years old, and the oldest, sixty-five years. The average age was forty-two and three-tenths years.

Among the pathological findings were prolapse of the first, second, and third degree, cervical erosions, cervical polyps, external and internal hemorrhoids, and retroversion.

Watkin's interposition operation was done in 122 cases, a modification of this operation in 5 cases, and Wertheim's operation in 1 case. In all cases a perineorrhaphy was done.

The most troublesome complication was post-operative cystitis. While recuperating from the interposition operation, 1 patient developed an acute attack of cholecystitis necessitating cholecystectomy and another died from pulmonary embolism.

The shortest period of hospitalization was fifteen days; the longest, sixty-four days; and the average, twenty-two days.

Ninety-two of the patients were traced. The anatomical result was good in 83 cases, fair in 3, and poor in 6. The symptomatic result was good in 71 cases, fair in 14, and poor in 7. Of the 14 patients with only fair results as regards symptoms, 11 complained of urinary frequency and incontinence and 1 of backache and sacro-iliac pains. In 1 case the symptoms were worse than before the operation although the anatomical result was good.

E. L. CORNELL, M.D.

Kakuschkin, N.: The Etiology and Prophylaxis of Myoma of the Uterus (Zur Ätiologie und Prophylaxe des Uterusmyoms). *Zentralbl. f. Gynaek.*, 1930, p. 2899.

This study is based on 688 cases of myoma, 444 in the clinic of the University at Saratow and 244 in the author's private practice.

Cases of myoma constituted 3.3 per cent of the total number of gynecological cases. They are relatively more numerous in the large university centers than in the smaller provincial towns and country districts. In 40 per cent of the cases reviewed the patient's living conditions were poor, and in 60 per cent they were satisfactory. The number of cases was too small to allow generalizations as to constitutional factors, body build, and body weight. The great majority of the patients were in the second half of the child-bearing period.

Two hundred and eight (30.2 per cent) had never been pregnant. The author makes no distinction between married and unmarried women. However, he states that the uterine myoma is not the cause of sterility in these cases, but is the result of a condition associated with the sterile state which favors the development of myoma. Perhaps the cause should be sought in the sterility itself as the expression of functional idleness of an organ which is intended to undergo a periodical pregnancy. Secondary sterility has been observed as well as primary sterility. The author presents a table which shows that almost 80 per cent of the women who have become pregnant have had more than one pregnancy, and 45 per cent, more than three.

Three factors seem to be involved: (1) increased procreancy due to intensified ovarian function, (2) diminished function of the uterus due to primary or secondary sterility, and (3) the development of the myoma of the uterus. The author believes that the myoma is a pathological reaction to an intensified ovarian stimulation replacing the normal physiological reaction of pregnancy. When pregnancy does not occur the irritative power of the follicle continues, the regulatory function of the corpus luteum and fetus is absent, and the potential energy of muscular elements of the uterus is manifested abnormally. The author characterizes uterine myoma as the menstrual product of a sterile woman with a high reproductive potency.

The fight against uterine myoma is essentially a fight against female sterility. The best preventive of the condition is pregnancy. The next best is weakening of the follicular potency of the sex glands by resection of the ovary. Myomectomy should be done as early as possible. At the time of the laparotomy other causes of sterility may be found incidentally and corrected.

WILLE (G).

EXTERNAL GENITALIA

Orfila, J. P.: Cancer of the Vulva (Cáncer vulvar). *Bol. oficial liga uruguayana contra el cancer genital femenino*, 1930, x, 156.

Twenty cases of cancer of the vulva are reviewed. One of the patients treated by operation alone is alive after fourteen years and another after five years. One treated by radium irradiation and electrocoagulation is alive after five years and another after two years. One treated with radium alone is alive after two years; two treated by operation and radium irradiation are alive after one year; and one treated by electrocoagulation and radium irradiation is alive after a year.

The author concludes that in order to increase the frequency of early diagnosis of cancer of the vulva

intensified anticancer propaganda is necessary. Attention should be called particularly to the treatment of leukoplakia and pruritus of the vulva. In operable cases, combined treatment should be used—surgery followed by irradiation or irradiation followed by surgery. In operable cases in which the patient's resistance is good, surgical treatment should be given first, whereas in operable cases in which the resistance is poor, irradiation should be given first. Operation should be radical; incomplete operation is harmful. Radical operation is of two types—vulvectomy with removal of the inguinal glands in cases of beginning tumors, and enlarged vulvectomy with removal of the ilio-inguinal glands in cases of advanced vulvar cancer, vulvo-urethral cancer, and cancer of the clitoris. In inoperable cases, irradiation, possibly preceded by electrocoagulation, should be used.

In conclusion the author says that in the treatment of cancer of the vulva special attention should be paid to chemotherapeutic and serotherapeutic methods.

AUDREY G. MORGAN, M.D.

Ivanov, N. Z.: Some Ideas on Gonorrhoeal Vaginitis (Quelques notions sur la vaginite blennorragique). *Gynec. et obst.*, 1931, xxiii, 128.

The author presents data which he obtained in the State Venereal Institute at Moscow, of which he is a Section Chief. As in cases of acute gonorrhoeal vaginitis he was able to demonstrate the gonococcus even when the vaginal epithelium had been thoroughly cleansed, he concluded that the organisms were lodged between the cells of the epithelium. His theory being contrary to current theories regarding gonorrhoeal vaginitis, he resorted to biopsy to confirm it. This article is based on 200 biopsies made in cases of acute or chronic gonorrhoeal vaginitis. The specimens included the whole thickness of the vaginal wall, a study of the mucosa, submucosa, and muscular layers being therefore possible. The sections were mounted and were stained with methylene blue and by Gram's method. The article contains drawings, photomicrographs, and typical case histories. The findings and conclusions follow:

1. Acute gonorrhoeal vaginitis is frequently observed in adult women.

2. In acute gonorrhoeal vaginitis the infiltration, hyperemia, and other phenomena of inflammation frequently penetrate deeply, involving the muscular layers. In some cases they involve the whole thickness of the vaginal wall.

3. The clinical phenomena may disappear and the appearance of the mucosa may return to normal while gonococci still remain in the deeper layers.

4. In acute vaginitis the phagocytosis of gonococci by polyblasts of the subepithelial connective tissue may be noted.

5. Acute gonorrhoeal vaginitis is due to local infection of the vaginal mucosa during coitus and is not dependent upon a discharge from the cervix.

6. Chronic vaginitis is a stage of chronic neisserian infection and may be permanent.

7. In 50 per cent of women suffering with vaginitis of an unknown type, biopsy showed that the gonococcus was an important factor.

8. In 25 per cent of the cases of vaginitis the condition was very severe. JAMES B. MASON, M.D.

Scaglione, S.: Adenocarcinoma of the Vagina (Dell' adeno-carcinoma della vagina). *Riv. ital. di ginec.*, 1930, xi, 584.

The author reports the case of a woman fifty-five years of age who had a friable cauliflower-shaped growth of the vagina situated about 2 cm. from the vulva. The tumor infiltrated the rectovaginal septum, but on proctoscopic examination the rectal mucosa appeared normal. The vault and lateral walls of the vagina were not involved. The uterus and adnexa were mobile and of normal size.

Microscopic examination of tissue taken from the vault and portio revealed normal vaginal mucosa. Histological study of a section of tumor tissue showed the neoplasm to be a poorly differentiated adenocarcinoma.

Treatment with radium was followed by complete disappearance of the neoplasm.

Among the possible sources of origin of adenocarcinoma of the vagina are embryonic rests of the Malpighi-Gaertner duct or the muellerian duct, aberrant cervical glands or uterine mucosa, and the cylindrical embryonal cells found among the basal cells of the vaginal mucosa by Amodei. The author believes that the tumor in his case originated from cells of the last type.

PETER A. ROST, M.D.

MISCELLANEOUS

Zondek, B.: The Anterior Lobe of the Pituitary Gland (Hypophysenvorderlappen). *Arch. f. Gynec.*, 1930, cxliv, 133.

Zondek's detailed report, intended for the meeting of gynecologists at Frankfurt in the spring of 1931, includes all of the facts so far established regarding the physiological significance and relationships of the anterior lobe of the pituitary gland in the human organism. This abstract is limited to the portions of the report which bring up for discussion problems which have not yet been solved.

Zondek first raises the question as to whether the varied actions of solutions of the hormones of the anterior lobe of the pituitary gland do not represent merely quantitative differences since small amounts cause only Reaction 1 and larger amounts cause Reaction 3. Up to the present time no studies have been made to determine whether deficiency of the hormone always results in one and the same reaction. Even though it is certain that the hormone which influences body growth is not identical with the hormone affecting sexual function, the extraction of the pituitary substance in the presence of various reactions does not constitute conclusive evidence that Prolan A and Prolan B are dissimilar. Moreover, it is an open question whether the substance contained in "prephyson," which is reputed to

decrease the basal metabolic rate and increase the specific dynamic reaction (Kestner, Plaut-Lieb-schuetz) may be considered a specific substance, a fourth hormone of the anterior lobe of the pituitary gland. It is also uncertain whether the formation of the "blood spots" in the pregnancy test, which has been called Reaction 2, is to be ascribed to Hormone A or B of the anterior lobe of the pituitary gland. Another question is whether sexual function is controlled by the ovum or the anterior lobe of the pituitary gland alone or by both. If it is regulated by the hormones of the anterior lobe of the pituitary gland, the question arises as to why it begins at puberty and ends at the menopause although these hormones are produced throughout life.

In the female, the hormone content of the anterior lobe of the pituitary gland represents from 100 to 160 mouse units of Hormone A and from 23 to 50 mouse units of Hormone B. The content of the somewhat smaller pituitary gland in the male, although subject to great variations, is about the same. This small amount (since as high as 10,000 mouse units are excreted in a liter of urine during pregnancy) is explained by the rapid transition of the endocrine secretion into the circulation.

In his efforts to isolate the hormones of the anterior lobe of the pituitary gland, Zondek has succeeded, by repeated precipitation and purification of the solutions, in obtaining a dry substance, 0.007 mgm. of which contains 1 rat unit. Chemical analysis of this substance for purin derivatives, carbohydrates, cholesterol, and lecithin as well as biogenic amines was negative. To date, attempts to separate absolutely both hormones of the anterior lobe of the pituitary gland in the urine of pregnant women have been unsuccessful thus far.

It is still questionable whether prolactin is capable by itself, of causing rupture of the follicles. Without prolactin there is no folliculin production. However, the latter begins before follicles are distinguishable in the ovary (Fels). Mixtures of Prolactin A and B produce different effects, depending upon the preponderance of one or the other hormone. The administration of large amounts of prolactin (as high as 20,000 rat units within six weeks) to sexually mature animals results in the formation of numerous corpora lutea without enlargement of the uterus. Up to the present time it has been impossible to produce pregnancy in infantile animals in which precocious maturity has been induced by the administration of Prolactin A. We do not know whether or what other factors with an inhibiting influence are present in the infantile organism.

In the cases of senile animals the administration of prolactin results in re-establishment of the estrus cycle in the same manner as the administration of folliculin. As the folliculin does not affect the ovary itself, it is possible that it stimulates the production of the hormones of the anterior lobe of the pituitary gland.

Prolactin is without effect in cold-blooded animals and birds, and the hormone of the anterior lobe of

the pituitary gland of cold-blooded animals and birds has no effect on warm-blooded animals.

The effect of hormones of the anterior lobe of the pituitary gland in the male differs from the effect produced in the female in the fact that enlargement of the testicle is less easily demonstrated than enlargement of the ovary after the administration of prolactin. In infantile animals, transformation of the immature cell elements into cells capable of spermatogenesis is promoted, but this effect becomes less pronounced with progressive development of the animal. Boeters reported that when he used a preparation of pituitary hormones that contained only traces of Prolactin B, no demonstrable increase in the interstitial cells could be noted even when large doses (2,000 rat units) were given. As prolactin is without effect also in castrated males, it is evident that its action depends upon the sex cells. However, there is considerable difference of opinion as to whether Prolactin A acts directly upon the generative part of the testicle (Boeters, Bortst) or on accessory organs such as the seminal vesicles (Krause).

The luteinizing hormone (Hormone B of the anterior lobe of the pituitary gland) inhibits maturation of the follicles by the effect of the lutin it produces and possibly by hormonal sterilization.

No relationship between the cell forms of the anterior lobe of the pituitary gland on the one hand and the various hormones of the pituitary gland on the other can be demonstrated. It is questionable whether the changes which have been noted under various circumstances in the relative relations of the recognized cell forms (chief cells, eosinophiles, and basophiles) in the pituitary gland during pregnancy and after castration are responsible for the changes in hormone production. It is possible that these changes in cell form are only secondary.

During pregnancy, the pituitary gland shows an increase in the number of chief cells at the expense of the eosinophiles, whereas following castration it shows an increase in the eosinophiles, but in both conditions there is an associated increase in hormone production.

It is possible also that the pregnancy cells or chief cells are in no way related to the increased hormone production of the anterior lobe of the pituitary gland. In the later months of pregnancy the latter is probably taken over by the placenta. Moreover, overproduction of hormone as well as cellular changes may be caused by various stimuli in no way associated with pregnancy, such, for example, as injections of horse serum into guinea-pigs, prolonged injection of folliculin into female guinea-pigs, and foreign protein injections.

The anterior lobe of the pituitary gland reacts to various types of stimuli with cellular changes without a change in hormone production. In the mutual relationship between the anterior lobe of the pituitary gland and the hormone of the ovary (folliculin), the former occupies the more important position, even though the inhibitory effect of folliculin upon the production of hormones of the anterior lobe of

the pituitary gland cannot be denied. However, parabiosis experiments in which a castrated male is united to an uncastrated female show no inhibitory effect of folliculin on pituitary hypersecretion. The folliculin which has been produced as a result of the influence of the "motor" (the hormone of the anterior lobe of the pituitary gland) therefore acts automatically as the regulator of its producer (the anterior lobe of the pituitary gland). However, the greater influence of the hormone of the anterior lobe of the pituitary gland is evident from the fact that after its removal sexual function ceases, whereas after removal of the gonads, the activity of the pituitary gland is increased.

The hypothetical hormone of castrates is a hormone of the anterior lobe of the pituitary gland, chiefly Prolan A. The pituitary hyperfunction associated with many types of tumor formation also produces chiefly Prolan A. Worthy of note is the preponderance of the production of hormones of the anterior lobe of the pituitary gland in tumor formations involving the genitalia. In carcinoma of the vulva, its incidence is 100 per cent; in cervical carcinoma, 82.5 per cent; and in carcinoma of the fundus of the uterus and the ovary, 75 per cent. In all genital carcinomata in women, it is 81.8 per cent as compared with 36 per cent in all extragenital carcinomata in women and 13 per cent in all genital carcinomata in men. This overproduction is probably a reaction of the anterior lobe of the pituitary gland to the increased growth processes in the malignant tumor.

To demonstrate the hormone in the urine following castration and in cases of tumor, Zondek recommends the concentration method which he has devised. Sixty cubic centimeters of acidified and filtered morning urine are mixed with 5 volumes of 96 per cent alcohol and the precipitate is separated by centrifugalization, washed in ether, and dissolved in 12 c.c.m. of water. Removal of the sediment by centrifugalization leaves an aqueous solution with a 5-fold concentration. Six doses of 0.3 c.c.m. each are injected into the test mouse.

To demonstrate the presence of the hormone in the blood, serum which has been detoxified by shaking with 5 volumes of ether has been found more satisfactory than citrated blood. Infantile rats can tolerate 12 c.c.m., and mice, 6 c.c.m. of this serum divided into 6 injections. The injection method is sufficient to demonstrate the presence of hormone of the anterior lobe of the pituitary gland if the blood contains 25 rat units per liter. In 80 per cent of cases, cessation of ovarian function at the menopause and after castration is proved by increased elimination of the folliculin-stimulating hormone in the urine. The reaction is positive also in 80 per cent of cases of tumors, benign as well as malignant. The pregnancy reaction is positive in from 98 to 99 per cent of cases. The rapid reaction is diagnostic only when it is positive.

The lowering of the basal metabolic rate and the increase in the specific dynamic action brought

about by hormones of the anterior lobe of the pituitary gland demonstrate an influence of this gland on metabolism. It is of interest to note that the hormone exerting this metabolic effect is excreted with the hormone found in the urine during pregnancy, but according to the studies of Evans it is absent in the presence of the hormone which regulates general body growth.

Zondek emphasizes that prolactin is active when given by mouth, but to a lesser degree than when it is given parenterally. This is true especially as regards its elements which influence metabolism. Its use is contra-indicated in cases of polyhormonal "polyfollicular" amenorrhoea. The prolonged administration of small doses is preferable to the use of single large doses. The intravenous administration of large doses is indicated in hæmorrhages due to ovarian dysfunction as it causes luteinization of the ovary. In adnexal inflammations, even those with acutely high fever, prolactin has a favorable effect as it quickly relieves pain. Worthy of note is the appearance of colostrum in the breasts during the treatment. The experience of H. Zondek has shown that the prolonged administration of prolactin is of value in cases of pituitary cachexia. It has given good results also in certain forms of eczema. An extension of its application may be hoped for when both prolactins can be administered separately.

FLESCHE (G).

Kraus, L.: Certain New Observations on the Action of the Anterior Pituitary. *Am. J. Obst. & Gynec.*, 1931, xxi, 391.

Pituitary glands obtained from rabbits, guinea-pigs, rats, and mice which had been treated with placental extract, placental tissue, corpus luteum hormone, folliculin, and the urine of pregnant women were implanted into immature mice. More lutein tissue and a greater number of pseudocorpora could be seen in the ovaries of such mice than in those obtained from animals into which normal pituitary glands had been implanted.

The promotion of follicular growth by the pituitary glands of animals treated with folliculin or placental tissue was variable, but occasionally increased. This phenomenon was even less pronounced after injections of placental extract, corpus luteum hormone, and the urine of pregnant women.

Injections of suprarenin did not increase the luteinizing action of the pituitary gland in transplants.

Implants of the placenta of guinea-pigs, cats, and rats into immature mice had only a slight effect on the ovaries.

X-ray irradiation of the head did not increase the luteinizing power of the pituitary gland. On the other hand, the pituitary glands of animals whose ovaries had been previously irradiated caused a distinct luteinization of the ovaries of immature mice.

The continuous administration of corpus luteum hormone, placental extract or tissue, folliculin, and

the urine of pregnant women to adult rabbits, guinea-pigs, rats, and mice caused a luteinization of varying degree attended with alteration or suppression of the ovarian cycle.

The anterior pituitary gland does not store hormones. The human placenta at term does not contain corpus luteum hormone. That the yellow body has a certain degree of independence of the ovum, is evident from the fact that it continues to function after removal of the ovum.

By the use of extracts of the anterior pituitary body, various investigators have shown that the anterior pituitary body contains two hormones which act on the ovary. One stimulates the development of follicles and the other activates the lutein tissue. In this article the author shows that the whole gland can produce both effects.

The anterior pituitary body itself is influenced by endocrine substances of the ovary and placenta. Consequently it does not absolutely control the ovarian cycle. On the other hand, a cyclic function of the anterior pituitary body due to this reciprocity is quite probable although not yet proved.

It must be borne in mind that the injection or implantation of various substances may act on the ovary of the immature mouse directly or affect it only indirectly through its action on the pituitary gland of the test animal. This introduces a possible error in the inferences drawn. E. L. CORNELL, M.D.

Riche, V., and Guibal, A.: Primary Cancer of the Female Urethra (Cancer primitif de l'urètre féminin). *Bull. Soc. d'obst. et. de gynéc. de Par.*, 1931, xx, 64.

Riche and Guibal report a case of basal-cell carcinoma of the urethra in a woman fifty-two years

of age. The chief symptoms were a loss of weight, urinary incontinence, acute pain in the perineum, and occasional bleeding from the vulva. The patient first noticed a tumor at the vulva seven months before her admission to the hospital. Examination revealed a crater-like ulceration 4 cm. in diameter which was limited anteriorly by the clitoris and posteriorly by the anterior vaginal wall. There was an associated low-grade chronic lymphadenitis.

Three applications of radium were given over a period of six months, but the general condition grew steadily worse and death occurred twenty months after the onset of the symptoms. Autopsy revealed no metastases. The cause of death was an intercurrent ascending urinary infection.

A review of the literature reveals a comparatively large number of reports of this condition. The onset is usually insidious. Medical advice is usually sought only after the process has become well advanced. As a rule the histological picture is that of a columnar- or basal-cell carcinoma, and the clinical appearance that of an ulcerating rather than an infiltrating lesion. The extension of the lesion is purely local. The inguinal glands are involved in only a third of the cases.

The prognosis is grave, the period of survival rarely exceeding a year. As in the case reported in this article, death frequently results from an intercurrent urinary infection rather than from general cancerization.

Treatment is very difficult and unsatisfactory except in early cases, in which radical surgery has occasionally been successful. Riche and Guibal are of the opinion that the use of radium in their case prolonged the life of the patient.

HAROLD C. MACK, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Friedman, M. H., and Lapham, M. E.: A Simple, Rapid Procedure for the Laboratory Diagnosis of Early Pregnancies. *Am. J. Obst. & Gynec.*, 1937, xxi, 405.

For the test described, the following materials and equipment are necessary: (1) an ordinary bedpan specimen of urine, (2) a 5-c.cm. syringe, and (3) an unmated, mature female rabbit. The urine is injected into the rabbit intravenously in doses of 4 c.cm. three times daily for two days. Forty-eight hours after the first injection the rabbit is killed. If the ovaries contain either fresh corpora lutea or large bulging corpora hemorrhagica, the reaction is positive and the woman who furnished the sample of urine is presumably pregnant.

The results obtained with this procedure were proved correct in all of the ninety-two cases for which the authors have satisfactorily complete records.

E. L. CORNELL, M.D.

Davidson, J.: Eclampsia and Puerperal Toxæmia. A Study of the Histological Changes Occurring in the Liver and Kidneys. *Edinburgh M. J.*, 1931, xxviii, 24.

The author states that in eclampsia and puerperal toxæmias the liver changes are frequently more severe, varied, and extensive than is generally recognized. The textbooks usually emphasize only degeneration of the peripheral cells of the liver lobules. Davidson found the following three types of histological changes: (1) necrosis in the peripheral zones of the lobules, (2) widespread necrosis of the central-zones and mid-zones of the lobules, the only remaining normal cells being in the peripheral zones in the vicinity of the portal tracts, and (3) small foci of necrosis and fatty degeneration of the cells.

The change of the first type is the change universally described as the typical liver lesion in eclampsia, but the change of the second type is equally frequent. The change of the third type is rare.

The severe liver lesion presents a striking resemblance to the lesion of acute yellow atrophy.

The cytoplasm of the liver cells is apparently affected before the nucleus. The first change is a cloudy swelling. This is followed by marked fatty degeneration, which in turn is followed by complete necrosis and disintegration of the cells with loss of the nucleus. The changes are very rapid.

In the cases studied by the author the lesions in the kidneys were more or less uniform. Advanced cloudy swelling of the lining cells of the secreting tubules was a constant finding. The glomeruli and the collecting tubules did not show much change. Chronic interstitial and vascular changes were rare.

The toxin of eclampsia or toxæmia of pregnancy has apparently a definite action on the endothelium of the blood vessels.

All of the pathological changes described were found in cases which were clinically typical of eclampsia with convulsions and a high blood pressure, cases with convulsions and a low blood pressure, cases without convulsions but with a high blood pressure, and cases without convulsions and with a low blood pressure.

CHARLES F. DEBOIS, M.D.

LABOR AND ITS COMPLICATIONS

Guttmacher, A. F., and Douglas, R. G.: The Induction of Labor by Artificial Rupture of the Membranes. *Am. J. Obst. & Gynec.*, 1931, xxi, 485.

The authors review 120 cases in which labor was induced by artificial rupture of the membranes. In 115 cases the pregnancy was at term. Seventy per cent of the patients were white women. Of the total number of patients, only 5 or 6 per cent failed to go into labor within twenty-four hours. In the 18 cases with a latent period of more than four hours before the onset of labor following the rupture of the membranes, the incidence of infection was 28.8 per cent, whereas in the 102 cases with a latent period of four hours or less, it was 6.86 per cent. In 3 cases the labor was very unsatisfactory, but it is uncertain whether the method of induction was in any way responsible.

One hundred and three (83.5 per cent) of the patients were delivered spontaneously. Among the 17 operative deliveries, there were 2 breech extractions. There was no constant relationship between the amount of fluid lost at the time of the rupture of the membranes, the expected date of confinement, or the size of the child and the length of the latent period or the duration of the labor. The character of the labor pains seemed to be in no way related to the amount of fluid drained off at the time of the induction of labor. However, the latent period was definitely shorter in both primiparæ and multiparæ with a short cervix and also in those in whom the cervix was dilated 2 cm. or more at the time of the induction of labor. The length of the labor seemed unaffected by the degree of cervical dilatation, but was influenced by the length of the cervix. The labor was definitely shorter when the cervical canal was short at the time of the rupture of the membranes.

Twelve of the 120 patients had a febrile puerperium (a rise in the temperature to 100.4 degrees F. on two days after the first day) due to infection. Accordingly, the maternal morbidity from this cause was 10.08 per cent. There were no maternal deaths. Seven of the infants died, the infant mortality being

therefore 5.88 per cent. If the death of 1 premature infant is excluded, the infant mortality was 5.08 per cent. This is similar to the infant mortality of 5.16 per cent in the last 14,416 deliveries at term.

Guttmacher and Douglas draw the following conclusions:

1. Labor at or near term can be successfully induced by artificial rupture of the membranes. The efficiency of this method is increased by the preliminary administration of castor oil and quinine.
2. This method is superior to the use of the bag and bougie.
3. This technique has decreased the average duration of labor and the incidence of puerperal infection and has not affected the infant mortality.

E. L. CORNELL, M.D.

Phaneuf, L. E.: The Cervical Cæsarean Section.
Am. J. Obst. & Gynec., 1931, xxi, 498.

This article is based on 418 cervical cæsarean sections, 2 of which were extraperitoneal, 58 transperitoneal, 160 intraperitoneal with a longitudinal cervical incision, and 198 intraperitoneal with a transverse cervical incision.

The operations were performed by the author in 31 hospitals which included large metropolitan hospitals and small country hospitals.

The cervical cæsarean section seems to insure protection against septic peritonitis, and assure better healing of the incision, and quicker convalescence.

In the cases reviewed the uncorrected maternal mortality was 5.0 per cent. The maternal mortality was lowest (3.0 per cent) in the 198 transverse cæsarean sections. Pulmonary embolism was the most frequent cause of death, being responsible for a maternal mortality of 1.79 per cent. For purposes of comparison, 53 consecutive classical cæsarean sections with a high fundal incision which were performed by the author are reviewed. In this group, the maternal mortality from pulmonary embolism was 3.7 per cent, 3 times higher than in the cases of cervical cæsarean section.

From this study it is apparent that pulmonary embolism is a frequent complication of cæsarean section whatever the type of the operation. This fact should be taken into account when abdominal delivery is considered.

The gross infant mortality in the cases reviewed was 5.9 per cent.

The cervical cæsarean section may be repeated with ease. The largest number of operations of this type performed on a woman was 6.

Eleven women had 14 pelvic deliveries following the cervical cæsarean section. In every instance the puerperium was normal.

In 105 repeated operations no intestinal adhesions were found.

For the intraperitoneal operation the author prefers the transverse cervical incision to the longitudinal incision.

In borderline cases an efficient test of labor may be given safely.

E. L. CORNELL, M.D.

Favreau: Abdominal Cæsarean Operations and Their Indications (Les opérations césariennes abdominales et leurs indications). *Gynecologie*, 1931, xxx, 82.

There are two types of abdominal cæsarean section—the conservative and the radical. The conservative operation is also of two types—the classical operation through the anterior wall of the exteriorized body of the uterus, and the low section which is done in the least contracted portion of the uterus and has the advantage that a double layer of peritoneum is used to cover the uterine scar.

Cæsarean section was performed in ancient times. In Rome, the lex regia commanded that section be done on a dead woman to save the infant. The operation was performed on living women in the sixteenth, seventeenth, and eighteenth centuries, but always with poor results because of the ensuing peritoneal infection. The first cæsarean sections on the body of the uterus were disastrous because infection was not considered. The patient gradually died of sepsis. In 1895, Bar recommended that the operation be done early, before rupture of the membranes, even before the onset of labor. Finally, Franck popularized the suprapubic transperitoneal section which can be done after a test of labor. The latest conservative operation is that of Portes, which can be performed in the presence of a certain degree of infection, the uterus being exteriorized for three or four weeks.

The author discusses the absolute and relative indications for cæsarean section. The operation is indicated by severe contracted pelvis due to rickets, spondylitis, fractures, congenital deformity, or achondroplasia. An anteroposterior diameter of 9.5 cm. is always an indication for cæsarean section. In borderline cases in which the anteroposterior diameter is between 9.5 and 10.5 cm., symphysectomy and premature labor may be tried or a low cæsarean section may be done.

In the majority of cases of moderately contracted pelvis it seems advisable to resort to a test of labor. In this way a useless operation may often be avoided. In fact, 50 per cent of the women for whom cæsarean section is considered may deliver naturally after a test of labor. It is difficult to decide the moment when the test of labor proves natural delivery impossible. Moreover, if infection at the time of operation is to be prevented, the test must not be continued too long after the rupture of the membranes. The developments during the first two or three hours after rupture of the membranes give an indication as to the necessity for operation. The energy of the uterine contractions, the mechanism of engagement of the head, the force of presentation at the cervix, and the condition of the fetus will aid in the decision. Other factors to be considered are the woman's age, her general health, and the number of internal examinations that have been made.

In determining whether a high or a low cæsarean section should be done it is necessary to consider

the viability of the child, the possibility of infection, the condition of the uterine muscle, and the previous use of forceps. A high operation is desirable when the cervix is little dilated, oedematous, and infected, when the uterus is contracted, and when conditions are unsuitable for a low caesarean section and permit temporary exteriorization of the uterus as in the Portes operation.

Other indications for caesarean section besides contracted pelvis are conditions requiring rapid evacuation of the uterus, the impossibility of parturition, and accidents of labor. Among conditions which may require rapid evacuation of the uterus are eclampsia, heart disease with decompensation, chronic nephritis, pernicious anemia, pyelonephritis, pulmonary tuberculosis, and death or coma during pregnancy. Conditions which may render parturition impossible include fibroma of the uterus, ovarian cyst, excessive size of the fetus, shoulder presentation, inertia or contracture of the uterus, anomalies of dilatation due to scars, and local disease such as cancer. Accidents of labor necessitating caesarean section are hæmorrhage from low insertion of the placenta, retroplacental hæmorrhage, prolapse of the cord, and fetal distress.

As the result of modern technique and particularly the development of the low caesarean section which permits conservative intervention after rupture of the membranes and the onset of labor, the indications for caesarean section have become more numerous. The best results are obtained by surgeons who perform the operation at the proper time and choose the technique most suitable for each case.

JACOB E. KLEIN, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Voron, J.: Autogenous Puerperal Infection (L' infection puerperale autogene). *Bruxelles-méd.*, 1930, xi, 462

Voron designates as "autogenous" those puerperal infections in which external sources of contamination can be ruled out—infections which must be attributed to organisms already present in or upon the body of the patient at the time of delivery. While clinical observations cannot furnish absolute proof of the occurrence of such infections, they nevertheless demonstrate a definite incidence of infection in cases in which the circumstances of labor and delivery quite definitely exclude an external source of contamination. Women with such infections must be considered carriers of pathogenic or non-pathogenic organisms within or outside of the genital tract.

It is difficult to form an opinion as to the exact incidence of autogenous puerperal infection, but it is highly probable that this type of infection plays a large part in the etiology of puerperal fevers which develop in spite of rigorous asepsis and antisepsis. As proof, the author cites the remarkable decrease in puerperal morbidity and mortality which followed the introduction of modern surgical technique and

the fact that, although modern technique is universally employed and has been constantly improved, the mortality from puerperal infection has never fallen below 1 per cent. On the other hand, the rarity of autogenous infections in relation to the large number of deliveries conducted in maternity hospitals and the large number of possible sources of infection (particularly in the presence of genital infections in apparently healthy women) suggests that these infections are conditioned to a greater degree by alterations in the local and general resistance of the patient than by the virulence of the causal organism.

Whatever their frequency, autogenous infections are in the majority of cases mild or only moderately severe. Severe and fatal infections occur more frequently in the presence of extragenital foci.

Prophylaxis against autogenous infection depends upon maintenance of the local defensive mechanism of the tissues against the invading organism (avoidance of trauma). Clinical and laboratory research must be combined in an effort to discover appropriate methods of immunizing the organism both locally and generally by means of sera and vaccines.

HAROLD C. MACK, M.D.

NEWBORN

Murphy, D. P., Wilson, R. B., and Bowman, J. E.: The Drinker Respiratory Treatment of the Immediate Asphyxia of the Newborn. *Am. J. Obst. & Gynec.*, 1931, xxi, 518.

This article is based on the cases of 35 infants treated by the Drinker method, which constituted 4.9 per cent of 709 consecutive infants born in 2 teaching maternity hospitals. All of the infants were handicapped by the condition of the mother before delivery, the nature of the delivery, or immaturity. Hence they suffered from more than a simple lack of oxygen or excess of carbon dioxide or both. They were placed in the respirator as soon as the upper air passages were believed to be clear. The treatment was carried on with the infant tilted head down at an angle of from 15 to 20 degrees and in either the supine or the prone position.

Only 3 of the 35 infants failed to breathe at all during the treatment. A few of them gave 1 or 2 gasps, but never developed a normally rapid rhythmic type of breathing. In the cases of the surviving infants there was first a single spontaneous breath, a short, weak gasp associated with a spasm involving the head and neck muscles. This was followed by similar breathing efforts occurring with increased frequency and vigor until the rate was rapid and steady. The respirator was then stopped as the infant was breathing adequately for its needs.

The majority of the infants survived. The surviving infants were those which were more mature, as indicated by their birth weights. The majority of the infants received their first treatment more than two minutes after birth. The largest number of survivors were among those treated earliest. Twenty-

five of the 35 had taken 3 or fewer than 3 breaths before they were treated. The majority exhibited the first sign of spontaneous respiratory activity within the first four minutes of treatment. One infant, which took no spontaneous breath for the first twelve minutes, finally breathed normally and survived. Fourteen infants died, 6 of cerebral hemorrhage and 8 of prematurity. A number of these infants lived for several hours after birth and 2 lived eleven and eighteen days respectively. It is therefore evident that the infants which survived for some time were suffering from injury other than simple asphyxia.

E. L. CORNELL, M.D.

MISCELLANEOUS

Garrod, L. P.: The Efficiency of Antiseptics Used in Midwifery. *Brit. M. J.*, 1931, i, 572.

This report is based on a series of bacteriological tests of germicides commonly used in British midwifery.

A memorandum issued by the London County Council and the Central Midwives Board relative to lysol gave particulars of tests which indicated that only strong solutions of lysol are capable of killing streptococcus pyogenes, and that different brands of lysol vary considerably in their bacterial potency. With the exception of phenol, lysol is the most caustic of all antiseptics in clinical use. Because of its weak germicidal action, a solution of sufficient strength to be effective is therefore an undesirable germicide in obstetrics.

The action of all germicides differs widely with different bacteria. The Rideal-Walker coefficient, the only evidence (if any) usually adduced regarding the activity of a germicide, refers to the action on the bacillus typhosus. Against the streptococcus, the lethal activity of the germicide may be considerably greater or less.

In the investigations reported, each of the germicides was tested in four ways. Its bactericidal action (that is, its ability to destroy the streptococcus in a given time) was studied in a medium of distilled water with no added organic matter and in the presence of a proportion of blood at the temperature of the body. In addition, the bacteriostatic action (that is, the ability of the germicide to prevent the growth of the streptococcus without necessarily destroying the micro-organism) was studied in a medium containing no protein and in a medium containing blood. The use of blood as the added organic matter appears justified by the conditions under which a germicide is used in obstetrics. Blood is the substance with which it will be chiefly mixed when it is used to prevent access of bacteria to the placental site or a cervical laceration. Serum, which has often been employed, milk, and sterilized faeces appear to be less appropriate.

The fifteen germicides treated included six which are commonly used in the United States, namely, phenol, lysol, mercury salts, acriflavine, brilliant

green, and mercurochrome. The conclusions drawn from the results of the tests are as follows:

Mercury salts. Not effective in the dilutions used clinically.

Lysol. Ineffective. The use of lysol even in strong solution (caustic strengths) leaves very little margin of safety.

Acriflavine. Has a bacteriostatic action in enormous dilutions, but its bactericidal action is weak. Its bactericidal power is somewhat diminished by the presence of blood.

Mercurochrome. This is a much weaker germicide than is commonly supposed. Ineffective.

Brilliant green. This was the most potent of all of the substances tested. It has no irritating effect even in strong solutions.

Acriflavine was found to be the most satisfactory bacteriostat and brilliant green the most efficient bactericide. The other substances were classed as doubtful or untrustworthy.

CHARLES F. DU BOIS, M.D.

Reeb, M.: The Importance of the Biological Test for Pregnancy—Aschheim-Zondek Test—in the Diagnosis and Prognosis of Hydatidiform Mole and Malignant Chorionepithelioma (L'importance de la réaction biologique de la grossesse—réaction d'Aschheim et Zondek—pour le diagnostic et le pronostic de la mole hydatiforme et du chorionépitéliome malin). *Bull. Soc. d'obst. et de gynec. de Par.*, 1931, xx, 94.

Reeb estimates the incidence of chorionepithelioma at 50 per cent following cystic mole, 25 per cent following abortion, and 25 per cent after full-term normal pregnancy. Of a series of 440 cases of hydatidiform mole, malignant chorionepithelioma developed in 21.

Histological examination throws no light on the possibility of the development of chorionic malignancy in mole tissue and is of no value in the prognosis of chorionepithelioma. Even the diagnosis of chorionepithelioma is often doubtful because the arrangement of the Langhans and syncytial cells is subject to wide variations. Microscopic examination of curettings usually gives no information as to the presence of invasion of the uterine wall by the chorionic elements, the disposition of the trophoblastic elements in an atypical chorionepithelioma differing but slightly from that observed in retained villi of early gestations. In spite of close observation and frequent studies of uterine curettings, the final diagnosis can often be made only after the process has extended beyond hope of cure.

The Aschheim-Zondek reaction, which makes it possible to detect continued chorionic proliferation through the biological effect produced by the hormone of the anterior lobe of the pituitary gland in the urine in such cases, is an important adjunct to the study of this condition. A positive test (Aschheim-Zondek Reaction 2 and 3) which continues for some time after the expulsion of a mole suggests continued chorionic proliferation. Therefore when a

positive reaction is obtained the patient should be kept under close observation and subjected to diagnostic curettage even in the absence of symptoms. A negative test offers reasonable assurance of safety. The amount of prolan excreted in cases of mole and chorionepithelioma is from 10 to 500 times that excreted during normal pregnancy. This difference is also of diagnostic importance.

Voron has reported 2 cases in which the Aschheim-Zondek reaction was of diagnostic and prognostic importance. In 1 case, urine examinations made at intervals after the expulsion of a cystic mole gave repeatedly negative reactions and the patient remained free from symptoms. In the other, repeated negative tests disclosed the benign character of tissue which histologically suggested an atypical chorionepithelioma following abortion. This patient also remained in good health after curettage was performed.

In conclusion the author gives his views regarding the nature of the hormone responsible for the Aschheim-Zondek reaction. He is inclined to accept the theory that the hormone originates in the

placenta rather than the anterior lobe of the pituitary gland. He bases his opinion on the work of Aron and Klein who demonstrated that, in addition to its action on the infantile ovary, the hormone of the pituitary gland exerts a specific effect on the thyroid gland which results in thyroid hyperfunction, cell hypertrophy, and progressive vacuity of the follicles, whereas the placental hormone influences the ovary in the same characteristic manner, but has no effect on the thyroid.

HAROLD C. MACK, M.D.

Elgart, J.: On Publioplasty. *J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 103.

The author describes in detail several methods of pubiotomy (pubioplasty) by which the pelvis may be permanently enlarged. He claims that by means of these procedures cesarean section may be rendered unnecessary in cases of contracted pelvis. In one type of pubiotomy, which may be transverse, frontal, or frontal oblique, the ends of the bones are firm. In another type, the middle fragment of the pubic bone is mobile. LEOPOLD GOLDSTEIN, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Gérard, M.: Renal Contusions and Their Late Effects (*Contusions rénales et leurs suites éloignées*). *Presse méd.*, Par., 1930, xxviii, 1457.

By contusion of the kidney is meant a renal lesion caused by traumatism. Contusions of the kidney are rare. According to statistics, they are found in only 1 of 2,500 cases of renal conditions coming to operation. They are most common in men between the ages of thirty and forty years. They may be caused by direct force such as a blow or crushing between 2 objects, or by indirect force such as a fall on the feet or the buttocks. The damage is often out of all proportion to the gravity of the accident.

The lesions observed in the kidney proper are classified according to their extent as subcapsular ecchymoses, subcapsular ruptures of the parenchyma, and ruptures of the capsule and parenchyma (fissures, lacerations). A hæmatoma may be formed in the fatty capsule as the result of the rupture of isolated vessels. This is rare. Occasionally there is a more or less complete rupture of the renal pedicle. Perirenal hæmatomata include the sanguineous collections resulting from attrition of the renal parenchyma. Urinary infiltration follows rupture of the renal pelvis or ureter, but never rupture of the parenchyma alone. The healing of lacerations is very rapid, being complete in fifteen days.

The first symptom of renal contusion is pain in one of the upper quadrants of the abdomen or in the flank. Occasionally the pain assumes a paroxysmal character as in renal colic. Shock is constant, but subsides in a few hours. Transient vomiting is very frequent. The hypothermia, rapid pulse, and fall in the blood pressure, when persistent, constitute a reliable index of the extent of the hæmorrhage.

Hæmaturia, the most constant sign, is present in 95 per cent of cases. It appears early and usually lasts about eight days. Occasionally it recurs intermittently for several months.

Acute retention of urine may be produced by clots in the bladder. Oliguria is constant during the first few days, but eventually gives place to polyuria. Anuria results only from grave bilateral lesions.

The physical signs of contusion of the kidney are: (1) tenderness to light pressure over the kidney, (2) great sensitiveness of the testicle and epididymis on the injured side, especially when a perirenal hæmatoma is present, (3) localized muscular rigidity, which often is of a sufficient degree to mask a perirenal effusion, and (4) an enlarged area of dullness in the renal fossa.

Injuries occasionally occur to abnormal kidneys. The most interesting injury to such kidneys is the

rupture of a hydronephrosis. In this condition, hæmaturia is often absent.

Hæmonephrosis can occur only when the renal capsule is intact and the hæmorrhage is abundant. Pressure atrophy follows and requires about two months to destroy the kidney completely. Hydronephrosis may develop as a result of obstruction of the ureter by a clot, rupture of the ureter, traumatic stricture, or compression by periureteral scars.

Rupture of a calyx or of the renal pelvis is followed by a pseudohydronephrosis. After a certain period, often after apparent recovery, a fluctuating mass appears in the renal fossa and enlarges progressively. There is no tendency for the fluid to become resorbed.

It is generally recognized that a mobile kidney may result from traumatism. Post-traumatic nephritis is probably not an entity, but a coincidence.

Calculi may form in an injured kidney very promptly. In 1 case they were found after an interval of forty-one days. Cases complicated by cord lesions are not considered here.

By creating an area of diminished resistance, traumatism may favor the development of renal tuberculosis.

Pain in the kidney region persisting for a long time is very frequent. It appears to be due usually to a chronic perinephritic inflammation.

When hæmaturia is present, rupture of the bladder must be ruled out. The extent and intensity of the local signs of effusion in the renal fossa are most important in indicating the gravity of the lesion.

Hæmaturia is most often absent in the very grave injuries with rupture of the ureter or renal vessels. Pyelography is permissible under rigidly aseptic conditions. It is contra-indicated immediately after the injury, but during the following week may be done to determine the cause of persistent symptoms.

The prognosis cannot be established accurately because minor accidents are seldom reported. However, it is generally good unless the pedicle is torn or the kidney is extensively crushed. Sequelæ are uncommon.

In the more serious cases the treatment indicated is immediate operation. Nephrectomy is not always necessary and should be avoided when possible. In cases of mild injury spontaneous recovery occurs. For cases of moderately severe injury no fixed rules can be established.

In the discussion of this report, LÉPOTRE says that the late ecchymoses which often develop at a distance indicate a hæmatoma of considerable size and justify operation. Except to evacuate a collection of blood or urine, surgery is rarely indicated in renal traumatisms. ALBERT F. DEGROAT, M.D.

Bumpus, H. C., Jr.: Tests of Function of Each Kidney Separately. A Comparison of the Value of the Specific Gravity of Urine with the Excretion of Phenolsulphonophthalein. *J. Urol.*, 1931, xxv, 387.

Bumpus compared the findings in cases in which the function of each kidney was estimated separately from the specific gravity of the ureteral specimens and from the excretion of phenolsulphonophthalein. Irrigation of the catheters to facilitate drainage was avoided. The test of specific gravity was made by the suspension method. A drop of urine from the specimen to be examined microscopically was placed in an equal mixture of stanisol (a light petroleum) and carbon tetrachloride. An excess of one or the other fluid was then added until the drop remained suspended, when the specific gravity of the mixture was determined with a hydrometer.

Seventy of the patients examined were thought to have a normal urinary tract. In nineteen, the specific gravity of the urine from each kidney was the same. Of fourteen cases in which there was a marked discrepancy in the specific gravity of the urine from the two kidneys, the excretion of phenolsulphonophthalein from the two kidneys was equal in four and indicated that the function of the two kidneys was approximately equal in the majority.

Of a series of twenty-seven cases in which unilateral stones were present, the specific gravity was lower on the affected side in fifteen.

There were ten cases of hydronephrosis. In only five was the specific gravity of the urine from the affected kidney lower than that of the urine from the normal kidney. In one, in which 90 per cent of the renal substance was found at operation to be destroyed, the discrepancy between the specific gravities of the urine of the two kidneys was 0.007.

In three of four cases of renal tuberculosis the specific gravity of the urine from the affected kidney was lower than that of the urine from the normal kidney. In the one exception the specific gravity of the urine from both kidneys was the same.

In all of four cases of hypernephroma the specific gravity of the urine from the affected side was markedly reduced.

In four cases of essential hæmaturia there was no uniformity in the effect on the specific gravity. The specific gravity of the urine from the affected kidney was higher than that of the urine from the normal kidney in two cases, equal to it in one case, and lower in one case. In every case, the excretion of phenolsulphonophthalein was higher from the affected kidney than from the normal kidney.

In seven of eight cases of unilateral renal infection of unknown origin the specific gravity of the urine from the affected kidney was lower than that from the normal kidney. In the one exception the excretion of phenolsulphonophthalein indicated better function in the involved kidney than in the normal kidney.

Twenty-two cases of bilateral pyelonephritis were studied. In nine, the excretion of phenolsulphonophthalein seemed to denote approximately equal function in both kidneys. A critical review of the twenty-two cases disclosed that in fifteen cases the results of the tests of specific gravity were about equivalent to those obtained with phenolsulphonophthalein.

The results are summarized. In ninety-nine cases the tests of specific gravity seemed to correspond to those in which phenolsulphonophthalein was used and to be comparable to the known clinical data. This gives an average accuracy of approximately 70 per cent provided the test with phenolsulphonophthalein and the clinical estimate are accurate. Accordingly, the test of specific gravity is a definite aid in diagnosis, but does not exceed in accuracy the test with phenolsulphonophthalein and should not be substituted for the latter.

Fuchs, F.: The Question of Pyelographically Visible Extravasations in the Renal Pelvis (Zur Frage der pyelographisch sichtbaren Nierenbeckenextravasate). *Ztschr. f. urol. Chir.*, 1930, xxx, 392.

It is occasionally difficult to differentiate a pyelovenous reflux from injection of a tubule. As it is likely that the contrast medium injected into the veins with their circulating blood is immediately washed away, protracted immobility of the contrast medium should suggest injection into a tubule. In a man aged thirty-nine years, the author observed, although he injected only 5 c.cm. of urobranol into the renal pelvis, an injection of almost the entire pyramid belonging to the most caudal calyx. Noteworthy features were the distinct club-shaped thickening of the calyx and the broadening of the renal pelvis. This was a case of injection of a tubule. Nephrostomy was followed by improvement.

The author emphasizes that with the progression of hydronephrosis the possibility of pyelovenous reflux becomes less because, on account of the atrophy of the papilla, the fornices at the site of the reflux disappear. In cases of hydronephrosis, Fuchs has often observed injections into the tubules, but has never seen a rupture of the fornix or a pyelovenous reflux even when the injection was given under high pressure. In pyelonephritis, the uriniferous openings of the papillae and the collecting tubules are dilated. Consequently, the slightest excess of pressure results in injection into the tubules and not a pyelovenous reflux.

Fuchs reports a case of frequent renal hæmorrhages in a woman thirty-seven years of age who had survived nephritis following angina. The finally successful pyelographic examination made after several attempts which were unsuccessful on account of insurmountable kinking of the right ureter, caused moderate pain even with filling of only 1 c.cm. The exposure made after the additional injection of 3 c.cm. disclosed, in the region of the three cranial calyces, extravasations which were partly horn shaped, had their origin in the fornices, and were interpreted as deposits of the contrast medium that had escaped into the renal sinus as a result of ruptures of the fornix. As the pains and hæmorrhages

recurred and the patient gave a past history of carcinoma, the kidney was exposed. However, decapsulation showed it to be absolutely normal. It was therefore replaced and nephropexy was done. Two months later the hæmorrhages recurred, but without pain. The author believes that the hæmorrhages originated from ruptures of the fornix and were not signs of a malignant tumor.

Fuchs states that especially when a pyelovenous reflux has been found on pyelography in a case of hæmaturia of unknown origin, nephrectomy may be avoided if the hæmorrhage is not threatening. Hæmaturia need not necessarily occur in every case of pyelovenous reflux since, as the result of the excessive pressure, the contrast medium may be forced into the vein through all sites of leakage. Moreover, the hæmorrhage cannot always follow this complicated route as under certain circumstances the blood coagulates previously and itself obstructs the passage to the renal pelvis. In the case of a man thirty years of age who collapsed during pyelography the pyelogram showed ruptures in the fornix in the cranial and middle calyces, but a few hours later it showed nothing abnormal. This was therefore a case of pyelovenous reflux without renal hæmorrhages. A. ROSENBERG (Z).

Busser, F.: The Histogenesis of Epithelial Tumors of the Kidney (Histogenèse des tumeurs épithéliales du rein). *Arch. d. mal. d. reins et d. organes génito-urinaires*, 1931, v, 541.

The author reviews 112 epithelial tumors of the kidney, 94 were epitheliomata and 18 adenomata.

The study of the 94 epitheliomata of the kidney showed that, from the macroscopic point of view, the incidence of the nodular forms (90 per cent) is much higher than that of the cystic and infiltrating forms. From the histological point of view, these tumors may be divided into: (1) those of the renal type, papillary or tubular; (2) those which are atypical, alveolar or trabecular; and (3) those of the intermediate type, combining the histological characteristics of the 2 preceding types and frequently showing points of transition from one type to another. The superposition of a macroscopic type on a histological type is impossible, each macroscopic form being composed of tumors belonging to the different histological types described. The latent forms revealed by a metastasis, generally osseous, are relatively frequent (5 in 94).

The study of the 18 adenomata of the kidney suggested that these tumors do not possess, any more than do epitheliomata, macroscopic characteristics indicating a definite histological structure.

With regard to hypernephromata, the author maintains that there are no findings which confirm the theory of Grawitz that these tumors develop from embryonic inclusions of the suprarenal cortex such as are frequently found under the capsule of the kidney. Moreover, this theory does not explain the intermediate forms observed in epithelial tumors of the kidney.

Numerous facts demonstrate the renal origin of the tumors called hypernephromata. The differences between the latter and tumors developed in the adrenals themselves show that these are entirely different types of tumors. A study of the intermediate forms confirms this opinion. It reveals the changes by which a renal type of structure, papillary or tubular, may reach an undifferentiated type, alveolar or trabecular. The inverse change, the origin of papillary or tubular formations at the expense of alveolar formations, is never observed in tumors of the adrenals, a fact agreeing with what is known of epithelial tumors originating at the expense of solid glandular parenchymas. Moreover, the kidney is not the only hollow glandular organ in which, besides tumors of homologous structure (i.e., "typical" tumors) tumors of "atypical" structure are found.

The article has a bibliography of 74 references.

PAGE.

Chauvin, E.: Intravesical Prolapse of the Ureter (Prolapsus intravesical de l'uretère). *J. d'uról. méd. et chir.*, 1931, xvi, 174.

In intravesical prolapse of the ureter the ureter is everted through the ureteral meatus, which is more or less changed, and protrudes into the bladder. First the ureteral mucosa, then the submucosa, and finally the muscular layer becomes prolapsed, the different coats being brought down successively in the same way as the coats of the rectum in rectal prolapse. Permanent ureteral prolapse has been identified seven times.

The author reports two cases, one that of a man and one that of a woman. In both, there was a history of calculi, which agrees with the general opinion that ureteral prolapse is not primary. The ureteral orifices were in the normal situation. In one case the ureteral orifice was largely permeable and presented no stricture.

The pathogenesis of prolapse of the mucous membrane of the ureter must be the same as that of prolapse of mucous membrane through any orifice. First there is an acting force, viz., ureteral contraction. Prolapse occurs only in association with a ureteropelvic lesion which causes abnormally violent contractions of the pyelo-ureteral musculature. These contractions tend to push or drive before them all of the contents of the muscular canal—urine, calculi, and mucosa. Slipping of the mucosa requires a certain laxity of the subjacent layers, an abnormal looseness of the submucosa. The mass of mucosa expelled can pass the ureteral meatus only when the latter is dilated or defectively oriented.

In the discussion of this report, LÉGUEZ said that he would consider Chauvin's first case a case of cystic dilatation. Prolapse is often observed in certain forms of tuberculosis and especially in cases of stones in the lower end of the ureter. It is generally transitory and comparable to a hæmorrhoidal mass. On the other hand, cystic dilatation, which is generally associated with a contracted orifice, shows none of the inflammatory dilatation of prolapse.

Only later, when the cyst is well developed, does it become prolapsed. Under such circumstances the entire cystic dilatation at first protrudes into the bladder and then through the urethra externally. Legueu has twice operated on the large extravascular pouch so formed.

MARION stated that several years ago the differences between prolapse and cystic dilatation of the ureter were clearly established by Mercier. In prolapse, the cause is nearly always a calculus. It is the violent contractions of the ureter seeking to expel the stone which produce the prolapse.

PASTEAU agreed with Legueu that Chauvin's first case was one of cystic dilatation. The illustration shows the elongated projection of a quite regular intravesical tumor, at the extremity of which there was a constricted punctiform orifice characteristic of cystic dilatation. PAGE.

Sertoli, L.: Considerations on the Morphology and Histogenesis of Ureteritis and Cystitis Cystica (*Considerazioni sulla morfologia e sulla istogenesi della ureterite e della cistite cistica*). *Arch. ital. di urol.*, 1931, vii, 249.

The author reports six cases of ureteritis and cystitis cystica. After reviewing several theories as to the cause and histogenesis of the cysts, he presents findings which indicate that the cyst formation is the result of a central degeneration of epithelial columns or nests which extend from the mucosa into the submucosa during chronic inflammatory processes of the urinary passages.

He believes that chronic inflammation of the ureter or bladder causes the formation of small duplications of mucosa or crypts lined by epithelial cells which appear as tubules extending into the submucosa. The duct of the tubules then becomes obstructed and the epithelial columns become separated from the mucosa by a layer of connective tissue.

The nests or islands of epithelial cells undergo central necrosis, the cells become swollen, and the nuclei become pyknotic and disintegrated. Coincident with the central degeneration there is a corresponding regeneration of the epithelial cells in the periphery of the cellular islands. The accumulation of the products of the disintegration with constant peripheral regeneration causes the cysts to increase in size. The larger or mature cysts that project from the mucosa show structural changes due to the internal pressure of the cysts. The epithelial cells lining the cysts near the mucosa are flat, whereas those lining the cysts near the base are cuboidal. The epithelial cells over the cysts are flattened and continuous with the normal mucosa of the urinary passages. PETER A. ROSE, M.D.

Renner, M. J.: Primary Malignant Tumors of the Ureter. *Surg., Gynec. & Obst.*, 1931, liii, 793.

Up to the present time only about fifty cases of primary malignant tumors of the ureter have been reported. The most common tumors of this type are

carcinomata. Of forty-eight tumors reported in the literature, thirty-two were located in the lower half, five in the middle portion, and six in the upper half of the ureter. In 40 per cent of the cases the neoplasm was a papillary carcinoma, and in 23 per cent it was a solid carcinoma. In the others, the diagnoses were cylindrical-cell carcinoma, adenocarcinoma, transitional carcinoma, and pavement epithelium carcinoma.

Sarcomatous growths of the ureter are much less common than carcinomata. The author reports a carcinosarcoma which arose from approximately the middle of the posterior wall of the ureter, filled practically the whole ureter as a sausage-shaped formation about as thick as a finger, penetrated into the urinary bladder, and ended in a round swelling about the size of an apple.

In conclusion the author says that the possibility of primary malignant tumor of the ureter should be considered in cases with renal tumor, hematuria, and pain. MAURICE MELTZER, M.D.

BLADDER, URETHRA, AND PENIS

Eisenstaedt, J. S., and McDougall, T. G.: Bladder Diverticula, with Especial Reference to Their Surgical Removal. *J. Am. M. Ass.*, 1931, xcvi, 831.

The authors define diverticulum of the bladder as a cavity in closest relation to the organ produced by a localized dilatation of the bladder wall. They then give a brief résumé of the theories as to the origin of such diverticula. They state that most vesical diverticula are acquired, but occur at a point of congenital weakness in the bladder wall. Herbst emphasizes the importance of infection in the production of the sac.

Most diverticula of the bladder open in the region of the ureteral orifices. They occur not infrequently at the site of the urachus. Involvement of the posterior and anterior walls is rare.

Diverticula vary in size, their capacity ranging from a few to 5,500 c.cm.

They vary also in shape. As a rule they are solitary, but in 10 per cent of the authors' cases they were multiple.

In 88 per cent of the authors' cases of diverticula in men the bladder was trabeculated from overwork caused by an obstructive process.

The sac may be bound down by adhesions to other organs or large vessels. In rare cases, the ureter empties into the diverticulum.

The thickness of the walls depends upon the degree of inflammation. Some sacs are quite thin as the result of stretching. The muscular coat is greatly thinned and may be absent. Leukoplakia of the lining has been reported. Infection in the diverticulum is important as symptoms usually begin when infection sets in. The source of the infecting organism is not easy to determine. Chronic infection always involves the walls and produces adhesions. Association of stone or tumor in the

diverticulum is not uncommon. The symptoms are not characteristic. As a rule there are no symptoms unless infection is present. The diagnosis is made by cystoscopy and cystography. Intravenous urography may be used when it appears that instrumentation may be dangerous.

Non-surgical treatment is of little value and should be employed only when operation is contraindicated. The operative treatment consists of complete removal of the sac or sacs, followed later by removal of the obstruction. The usual exposure of the bladder is employed with extraperitonealization of the organ. Preliminary drainage is not done. Before the bladder is opened the sac is dissected free. The bladder is emptied and the diverticulum and a cuff of normal bladder wall are removed. Drainage is left to the site of the sac.

Adherent diverticula may require dissection under the guidance of a finger in the sac. When there are marked adhesions it may be necessary to open the sac in its long axis before freeing it. Sacs which include a ureteral orifice require a special technique such as that of Young.

The authors report illustrative cases from a series of fourteen.

ANDREW McNALLY, M.D.

Bothe, A. E.: Lesions Causing Obstruction at the Vesical Neck. *Pennsylvania M.J.*, 1931, xxvii, 383.

The most common cause of obstruction at the neck of the bladder is hypertrophied tissues—the Albarran subcervical glands, the trigonal muscle, and the posterior commissural glands. In median bar hypertrophy, obstruction may be due to hypertrophy of either the subcervical glands or the posterior commissural glands or both. In hypertrophy of the posterior commissural glands, the trigonal muscle works harder to push against the mass and, becoming hypertrophied itself as a result, eventually constitutes the obstructing factor. In hypertrophy of the subcervical glands the trigonal muscle is uninvolved and its function is not disturbed.

Inflammatory obstructive lesions apparently have no relation to hypertrophy. Of fifty cases of posterior obstruction of the neck of the bladder, two were due to inflammatory tissue (inflamed median bar) showing histologically atrophic, sclerotic, and granulation tissue changes without hypertrophy. Practically all hypertrophic lesions are associated with chronic interstitial prostatitis. Associated tuberculous lesions of the prostate are apparently uncommon, but as surgeons frequently fail to examine the prostate histologically, they may be present more often than is generally believed.

Tumors of the prostate are rare. The most common are adenocarcinomata. Cases of primary carcinomatous growths of the prostate may be divided clinically into: (1) those with symptoms of urinary obstruction and without evidence of metastasis, (2) those with symptoms of metastases and little or no evidence of a primary lesion, and (3) those in which evidence of malignancy is found only on pathological study of the specimen. Extensive

sectioning of the prostate often reveals concealed small carcinomatous lesions not suggested by the symptoms or gross examination of the surgical specimen. Benign obstructive lesions may be due to hypertrophy of the cervical or posterior commissural glands. Adenocarcinoma may develop from either of these groups of glands.

Cysts of the prostate may be congenital or acquired. Those of the usual congenital form arise from closure and cystic dilatation of the prostatic utricle or inflammation of the urethral mucosa. Retention cysts are fairly frequent in hypertrophied prostatic tissue. Echinococcus cysts of the prostate are rare.

Congenital valves of the posterior urethra are uncommon. Only sixty-four cases have been recorded in the literature. The author reports a case. Highly satisfactory results have been obtained from the punch operation, but the obstruction may be so complete that, even when operation is performed at birth, death may result from the damage that occurred during fetal life. The prognosis depends upon the degree of the obstruction and the length of time it was present during fetal life.

Foreign bodies seldom cause obstruction at the urethrovaginal junction. However, secondary calculi formed in the kidneys or bladder occasionally become impacted in the prostatic urethra. Stones in the posterior urethra may be primary or secondary. The author reports a case of secondary stone. Primary stones may be due to abnormal constituents in the urine secondary to a stricture, pouch, or foreign body.

LOUIS NEUWELT, M.D.

Caulk, J. R.: Litholapaxy—The Method of Preference for the Removal of Vesical Calculi. *Ann. Surg.*, 1931, xciii, 891.

The author discusses the advantages and disadvantages of litholapaxy as compared with the suprapubic removal of stones from the bladder.

In about 25 per cent of 225 cases of vesical stone reviewed, calculi had been present or were still present in the upper urinary tract.

The indications for litholapaxy and removal of obstructive conditions at the orifice with the cautery punch are increasing.

The author believes that in cases of carcinoma of the prostate an open surgical operation should be avoided when possible. The combination of radium implantation and deep X-ray therapy and the punch operation gives much better results. Caulk has found that the carcinomatous urethra rarely prohibits litholapaxy.

In severe cystitis, bladder irritability and contracture may be decreased by adequate pre-operative drainage. With the use of twilight sleep and caudal anesthesia, the author has experienced no trouble with this complication.

In the cases of vesical calculus reviewed by Caulk, one of the most difficult stones to crush was no larger than a cherry. It proved to be a xanthine stone. Within certain limits, the size of a stone

offers no contra-indications to litholapaxy. Very often, the larger the stone, the softer it is and the easier it is to crush.

In cases of very large stones, the author has found it advantageous to crack the outer coating. In several cases in which he did this without removing the stone and then changed the chemical character of the urine by injecting bulgarian bacilli, the stone underwent spontaneous fragmentation making litholapaxy for the removal of the remaining fragments a simple procedure.

Caulk always follows litholapaxy by instillations of bulgarian bacilli. In several instances in which cystoscopic examination after crushing of the stones revealed numerous fragments in the bladder, the bladder was found entirely clean a week later. This is particularly apt to be the case when the stones are of the phosphatic type. When repeated crushings are required, an indwelling catheter should be employed and careful attention given to the bladder.

Caulk believes that in cases of stones which are difficult to remove, repeated operation is far preferable to a long-continued operation under anesthesia and to the excessive trauma of repeated instrumentations. The operations should be separated by an interval of from four to seven days.

In the cases reviewed there were very few complications from litholapaxy. Pyelonephritis occurred in 4.4 per cent, epididymitis in 4.4 per cent, hemorrhage in 1 case, periurethral abscess in 3 per cent, and impaction of a urethral calculus in 3 per cent.

In 112 cases of litholapaxy the average stay in the hospital was ten days. Most of the patients with simple stones were discharged after two or three days. In cases of complicated stones the patient was obliged to remain in the hospital a longer time for treatment of the complications.

The indications for the suprapubic operation are large stones, stones which are adherent to the bladder wall, and stones associated with such pathological conditions as prostatic obstruction, stricture, diverticulum, and tumor. The average stay in the hospital in cases in which suprapubic cystotomy is done is thirty-nine days.

The author regards litholapaxy as the operation of choice in the majority of cases of stones in the bladder, regardless of the size or number of the calculi. This procedure is sometimes possible even in cases complicated by obstruction, tumor, or active cystitis. It is strikingly free from complications, and its mortality is relatively insignificant. Its results, as gauged by the frequency of recurrence, seem to be superior to those of surgery, and it shortens the period of hospitalization.

C. TRAVERS STEPIT, M.D.

Higgins, C. C.: Benign Tumors of the Bladder. *Ann. Surg.*, 1931, xciii, 886.

The author adds another case of benign tumor of the bladder to the thirty-eight reported in the literature in 1922, and the few more that have been reported since then.

Benign papillary tumors of the bladder are classified as follows:

1. Myoma: (a) fibromyoma, (b) leiomyoma, (c) rhabdomyoma.
2. Fibroma: (a) hard fibroma, (b) soft fibroma.
3. Angioma.
4. Myxoma.

The tumors grow rather slowly and as a rule do not cause symptoms. Their cause is unknown. They vary in size from that of a pea to that of a neoplasm weighing several grams. They usually occur in the region of a ureteral orifice. In many cases they are found first at autopsy. Symptoms are usually due to obstruction. There are no characteristic diagnostic signs. As a rule the diagnosis is first made after excision. The prognosis is good. The best treatment is excision.

In the author's case the patient complained of intermittent hæmaturia and limited bladder capacity, and examination revealed a large pedicled tumor situated in the region of the orifice of the left ureter. Excision of the tumor was followed by uneventful recovery. Microscopic examination showed the neoplasm to be a fibromyxoma.

MAURICE MELTZER, M.D.

GENITAL ORGANS

Constantinesco, N. N., and Picard, J. A.: The Bladder Pouch and Residual Urine in Persons with Prostatic Conditions (*Bas-fond et résidu vésical chez les prostatiques*). *J. d'uroi. et chir.*, 1930, xxx, 545.

The factors involved in the retention of urine are numerous, but may be divided into two groups, the mechanical and the dynamic. The theories regarding the mechanism of retention of urine are the mechanical theory, the dynamic theory, and the theory of mixed causes. The mechanical theory attributes the retention to obstruction created by the prostatic enlargement. The dynamic theory recognizes the action of the hyperplasia on the subservicular glands only insofar as it brings about a histopathological change in the neck of the bladder. The theory of mixed causes admits the rôle of the mechanical obstruction, but ascribes an important part also to dynamic disturbances.

To determine whether a pouch is present in the bladder in enlargement of the prostate, the authors made lateral cystograms in the cases of seven patients in various stages of prostatic disease. In addition, having observed on cystoscopic examination in a case of prostatic enlargement that calculi were lodged behind the neck of the bladder, they introduced foreign bodies opaque to the roentgen rays into the bladders of patients about to be operated upon and then determined the location of the foreign bodies by cystoscopy and lateral cystography. They draw the following conclusions:

1. In the majority of cases of hypertrophy of the prostate there is a vesical pouch which may be seen equally well by cystoscopy and lateral cystography.

The pouch is situated behind the neck of the bladder, and it is here that calculi become located in cases of prostatic enlargement.

2. The residual urine does not collect in the pouch. It is distributed throughout the bladder and is found especially in the anterior portion, that is, in front of the bladder neck when the patient is in the recumbent position. This distribution may be attributed to the pressure of the intestinal loops caught in the rectovesical space.

3. Contrary to the classical conception, there is no relation between the size of the pouch and the amount of residual urine. It may be said that the largest residues lead to diminution or disappearance of the vesical pouch.

4. The retention of urine in cases of prostatic enlargement seems to be due to weakening of the vesical wall caused by the constant effort of the bladder to overcome the progressive obstruction of its neck.

5. The neck of the bladder is not fixed in cases of prostatic enlargement. In the majority of cases, in correspondence with the amount of residual urine, it is displaced downward and backward.

WILLIAM W. WHITELOCK, PH.D.

Seng, M. I.: A Study of the Blood Pressure in Prostatism, Including Cardiovascular Changes. *J. Urol.*, 1931, xxv, 313.

This report is based on 454 cases of prostatism which were operated upon successfully. A study of the cardiovascular system in fatal cases disclosed arteriosclerosis in 28 per cent, enlargement of the left heart in 46 per cent, enlargement of the right heart in 13 per cent, and chronic endocarditis in 20 per cent. The conclusions drawn by the author are as follows:

1. The blood pressure alone is not a satisfactory index of the condition of the cardiovascular system, but is suggestive.

2. The risk of prostatectomy is least when the blood pressure is normal. In cases with a normal blood pressure healing occurs rapidly. Fatalities are usually due to cardiac or pulmonary involvement.

3. When the blood pressure is low, the surgical risk is greater. Healing occurs sluggishly. As a rule there is advanced renal and cardiovascular degeneration which makes it necessary to limit operative procedures to the simplest measures. Death frequently results from cardiac and renal involvement.

4. The surgical risk is greatest in cases of high blood pressure, in which cardiovascular, pulmonary, and renal lesions are apt to be present.

5. A large percentage of deaths following prostatectomy are due to lesions of the cardiovascular system, especially those involving the myocardium.

6. The least controllable of the complications following prostatectomy are pulmonary complications.

7. The mortality from renal involvement after prostatectomy has been greatly reduced.

8. In the presence of serious lesions of the cardiovascular, renal, and pulmonary systems, special care must be taken to prevent infection during prostatectomy.

9. The operative mortality of prostatectomy may be lowered by a more careful search for, and study of lesions of the cardiovascular system, more care in the selection of cases for the operation, and prolonged drainage in cases with severe myocardial change.

JOHN P. O'NEIL, M.D.

Thomas, G. J., Exley, E. W., and O'Brien, W. A.: Causes of Death Following Treatment for the Relief of Prostatic Obstruction. *J. Urol.*, 1931, xxv, 343.

This article reports a study of the causes of death in thirty cases of prostatic hypertrophy. In 93 per cent, urinary infection was found to be a major factor. In 93 per cent of the cases urethral catheterization had been done at some time during the pre-operative preparation. Forty per cent of the patients never reached the operating table.

The authors conclude that the majority of deaths occurring during the treatment of prostatic hypertrophy are due to a bacteremia caused by infection already present and infection introduced by instrumentation.

J. SYDNEY RITTER, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Canavero: Solitary Osteogenetic Exostoses (Esostosi osteogenetiche solitarie). *Chir. d. organi di movimento*, 1931, xv, 411.

The author reports five cases of congenital exostosis. The first was that of a man thirty years of age who had a large exostosis on the inner side of the surgical neck of the humerus presenting as a tumor in the axillary region, and the second, that of a nine-year-old boy with evidence of rickets and an exostosis on the inner side of the upper third of the right humerus. In the third, that of a girl nineteen years of age, there was a large exostosis on the posterior surface of the upper end of the right tibia, and in the fourth, that of a nine-year-old girl, a similar exostosis on the anterolateral surface of the tibia just below the upper epiphysis. The fifth case was that of a twenty-year-old man who had a large bony outgrowth at the upper end of the left fibula.

Röntgen examination in all of the cases showed the exostosis to be of the benign congenital type. In four cases it was successfully removed. All of the sections studied showed spongy bone of perfectly normal character.

The author discusses the causes of exostoses of the traumatic, multiple, inflammatory, tuberculous, congenital, and non-inflammatory types.

Exostoses may press upon or distend blood vessels and may be mistaken for, or cause aneurism. In some cases their removal is necessitated by pressure upon nerves or other structures. Cosmetic reasons usually lead to operation. KELLOGG SPEED, M.D.

Harris, H. A.: Cod-Liver Oil and the Vitamins in Relation to Bone Growth and Rickets. *Am. J. M. Sc.*, 1931, clxxxi, 453.

Cod-liver oil has been used empirically by the laymen of the Atlantic coasts for countless years. The first record of its use by physicians appeared in 1771 in the *British Pharmacopœia*. In 1840, Steinhäuser of Heidelberg published a classical contribution on its use and effects as we know them today. Some reputable pediatricians contend that any other oil will do just as well. In Denmark, the disease xerophthalmia which, previous to the World War, had been kept partly under control by cod-liver oil, disappeared when the children were given butter after the supply of margarine had been cut off by the blockade.

Exposure to sunshine is not necessarily the most important factor in the prevention of rickets. If animals eat vegetables or other animals which have been irradiated, they receive the benefit of the vitamins stored in the tissues of such vegetables or

animals. The discovery that ultraviolet light forms Vitamin D in cholesterol and ergosterol was followed by an orgy of quackery. Too much dependence has been put on the synthesized vitamins with consequent neglect of fresh foods. Experiments to determine the potency of cod-liver oil are misleading when they are carried out on animals such as rats and guinea pigs; the results cannot be applied to man. Reports of the calorimetric and biologic tests made by the Chemical Society in 1927 show that the liver oils of many other fish and certain mammals yield from 10 to 100 times more Vitamin A than the liver oil of the cod fish.

Our knowledge of the chemistry of bone is still somewhat hazy regarding the form of the calcium. This is due partly to the fact that most analyses are made on bone ash rather than on living bone. In investigations carried out on animals with regard to the physiology of calcification the wide variation in the stages of calcification at a given age in different animals is often not considered. Vitamin A is believed to be the controlling factor in the differentiation of the bone-marrow cell from the bone-forming osteoblast. It controls the differentiation of cell function also in all other tissues. Excessive proliferation of cartilage is controlled by water-soluble Vitamin B, and the calcification of cartilage by Vitamin D. Thus all three vitamins are important factors in the healing of rickets and none of them can effect a cure in the absence of others. As cod-liver oil contains an adequate and balanced supply of the three vitamins, it is superior to the advertised substitutes. WILLIAM ARTHUR CLARK, M.D.

McLean, S.: Progress in Pediatrics. III. Correlation of the Roentgenological Picture with the Gross and the Microscopic Examination of Pathological Material in Congenital Osseous Syphilis. *Am. J. Dis. Child.*, 1931, xli, 607.

The author reports the findings made at autopsy on sixteen babies with congenital syphilis. The oldest child was thirteen months of age. Thirteen of the infants were not over three months old. In all, the roentgenograms showed bone changes.

The first case was that of a white female infant eight weeks old. The symptoms began in the fifth week of life. Skin lesions were prominent. The roentgenogram showed a calcium cap on the distal metaphyses of the radius and ulna and rarefactions in the ends of one humerus, one clavicle, and both femora. Some of these areas were demonstrable in the gross autopsy specimens as softening in the bone.

In the second case, also that of a white female infant, a rash developed during the first few days of life. Death occurred at the end of a month. Roentgen examination showed lesions in all of the bones of

both legs and one arm and in a few metatarsal and metacarpal bones. At autopsy, the left femur and tibia showed a double layer of cortex. Microscopic examination revealed nothing abnormal.

In the third case, that of a white girl one month old, there were extensive cutaneous lesions, a bloody nasal discharge, and enlargement of the liver and spleen. Roentgenograms showed enlargement of the ends of all long bones and areas with "worm-eaten" appearance. The epiphyseal lines were shadowy and irregular, and there were areas of rarefaction with an irregular spotted distribution. At autopsy, the areas of rarefaction at the ends of the diaphyses were found to consist of a very soft yellowish material and to be extremely weak. Next to these areas on the shaft was a hard gritty formation which could not be penetrated with a needle. Microscopic examination of the areas presenting a "worm-eaten" appearance in the roentgenogram showed them to be composed of granulation tissue, cartilage cells, and an intercellular ground substance. A few granular forms of spirochaetes were found.

In the fourth case, that of a colored girl two months old, the condition caused enlargement of the epiphyses, spasticity, icterus, and exfoliation of soles and palms. The Noguchi and Kahn tests were 4+. Roentgenograms showed pronounced bilateral periostitis of the humerus, femur, and tibia and partial separation of epiphyses with impaction in several places. The gross specimen of a tibia at autopsy showed soft submetaphyseal areas and a secondary periosteal tube on the shaft. Microscopic sections revealed distorted trabeculae, enlarged cartilage cells, and invasion of connective tissue in the metaphyses. The secondary periosteal layer consisted of a dense fibrous outer layer and an inner cellular layer in which new bone was being formed.

In the fifth case, that of a colored girl of eight weeks, the lesions were mostly osteomyelitic. The Noguchi and Kahn were 4+. Typical "punched-out" areas seen in the roentgenograms were found at autopsy to be cavities containing yellowish-gray, soft material without calcified matter. Microscopic examination showed this substance to be connective tissue with a few spicules of degenerated bone.

The findings in the other cases were more or less similar. In one case which was a striking example of syphilitic periostitis a cross-section of the femur showed multiple lamellae almost like the rings of a tree trunk which were formed by alternating layers of fibrous periosteum and a substance which was like marrow.

The article contains numerous illustrations, many of them in color. WILLIAM ARTHUR CLARK, M.D.

Rose, C. B.: X-Ray Treatment of Bone Metastasis. *Radiology*, 1931, xvi, 536.

The author's experience with metastatic carcinoma in bone from the breast, prostate, or other organ includes fifty cases. An analysis of the results of roentgen treatment has led her to the conclusion that although roentgen irradiation does not cure, it

prolongs life, relieves the pain to a surprising extent, and often renders the patient able to enjoy life and participate in his usual activity. She reports six cases in which roentgen treatment resulted in marked benefit, and supplements the case histories with numerous illustrations to show the retrograde changes in the bones treated.

Her technique of irradiation is described in detail. She has found frequently repeated doses of moderate voltage to be sufficient. ADOLPH HARTUNG, M.D.

Weissenbach, R. J., Francon, F., Gerbay, F., and Robert, P.: Two Cases of the Chauffard-Still Syndrome—Chronic Progressive Fibrous Deforming Rheumatism with Adenopathy and Splenomegaly (Deux cas de syndrome de Chauffard-Still—rhumatisme chronique fibreux déformant progressif avec adénopathies et splénomégalie). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1931, xlvii, 172.

In 1896, Chauffard and Ramond reported 7 cases of chronic infectious rheumatism in adults which were characterized by adenopathy adjacent to the affected joints. In 1897, Still described a similar joint disturbance associated with splenomegaly and adenopathy in children from two to six years of age. Since 1897 about 100 cases have been reported. The authors report the cases of 2 adult women.

Chronic arthritis may affect many joints. Especially in the hands and fingers it is often symmetrical. It may last for many years. Its course is progressive, usually with acute exacerbations and the development of vicious flexion deformities in the fingers, wrists, and elbows. The roentgenogram may show narrowing of the carpal joints and synostoses between the radius and ulna, the bones of the carpus, and the carpus and metacarpus. In the average case of this type however, there may be few, if any, positive roentgen findings.

The adenopathy, which is discrete and accompanied by no periadenitis, involves the neighboring lymph glands. The glands reach the size of a pea and are either soft or hard.

Splenomegaly is revealed only on percussion as the spleen is not palpable (12 by 5 cm).

The general health is only fair. Loss of weight occurs, and the patient is pale. Fever is absent.

The blood shows anemia and a moderate leucocytosis with mononuclears, particularly lymphocytes, predominating. The uric acid content of the blood is normal or decreased. The calcium and phosphorus content and the clotting time of the blood are normal. The blood pressure is a little low. No visceral abnormalities are apparent. Especially after bath treatment, there is an occasional erythema. The urine shows traces of albumin. Slight protrusion of the eyeballs is noted.

Actinotherapy with ultraviolet rays, atophan, and sodium salicylate have been used, but the best results have been obtained from the internal administration of iodine. Hot baths afford relief.

KELLOGG SPEED, M.D.

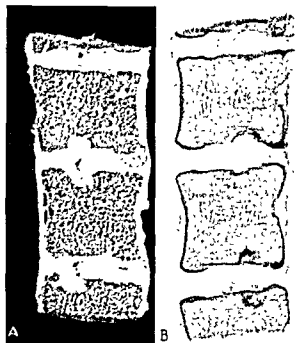
Sashin, D.: Intervertebral Disk Extensions into the Vertebral Bodies and the Spinal Canal. *Arch. Surg.*, 1931, xxii, 527.

The intervertebral disk consists of a central expansile pulp, a thin cartilage plate on each side, and a surrounding band of fibrous tissue.

The author reports 9 cases in which the central pulp expanded or extended into the spongy bone of the vertebral bodies. In some of them the extension occurred in a small area as though through a rupture in the cartilage plate, and in others, over a wider area, causing a concavity into the vertebral body. In three cases there was a history of trauma, but in the remainder the symptoms came on gradually and were of a rheumatic character.

This condition has been the subject of reports by other clinicians during the past four or five years. Schmorl called the extensions "cartilage nodes." The extensions of the pulp through the cartilage plate of the disk are frequently transformed into cartilage and persist as such. They were found in 38 per cent of 2,000 autopsies reviewed by Schmorl.

The extension may go in the direction of the spinal cord as well as toward the vertebral bodies. The author cites from the literature a case in which they were found in the spinal canal at operation for paralysis following injury.



A shows a sagittal section of several vertebral bodies with three disk extensions. The two upper nodes have a soft elastic consistency. The lower node is cartilaginous and in places ossified. B is a roentgenogram of Section A. The upper disk node presents a bony defect or area of bone destruction while the lower node presents bone production.

The clinical significance of these nodes has not been definitely established. Some think the nodes predispose to spondylitis deformans, especially in young persons. Symptoms are usually not present unless the nodes are of sufficient size to show in the roentgenogram. It is thought that the development of the nodes may be due to a pre-existing weakness in the vertebral column.

WILLIAM ARTHUR CLARK, M.D.

Dupuy de Frenelle: Traumatic Spondylitis, Kummel-Verneuil Disease (Spondylite traumatique, maladie de Kummel-Verneuil). *Paris chir.*, 1930, xxii, 174.

In the development of traumatic spondylitis there are three stages. The first stage, which follows a trauma of the vertebral column, is characterized by neuralgic pain in the back or kidneys lasting several hours or days, and sometimes by motor disturbances leading to contractures, spasms, or even paralysis of the muscles of the leg. In the second stage there is at first such marked improvement that after several days or weeks the patient resumes his occupation and believes he had only an attack of lumbago. However, from time to time he experiences sharp pains which interfere with his work. This stage lasts several months. After a year or more the vertebral deformity characteristic of the third stage develops. Pain is then noticed after heavy work or sudden effort to raise the body or bending over. A dorsal or dorsolumbar kyphosis appears. Finger pressure on the spine is painful, and active and passive movements of the spine become limited.

In some cases the trouble may disappear in from eighteen months to two years without treatment, but a slightly sharp gibbus persists. In others, the trouble lasts for several years. In all cases of spinal trauma, however unimportant it may seem, an X-ray examination should be made. The lateral view may show small cracks in the bodies of the vertebrae.

If the pain continues, a roentgen examination should be made every two weeks. Traumatic spondylitis is based on fracture of one or more vertebrae, and failure to immobilize the fracture leads to softening of the vertebral bodies from decalcification.

The methods of immobilizing the spine with plaster of Paris and other splints and by bone grafting are reviewed briefly. KELLOGG SPEED, M.D.

Mucci, D.: A Tumor of the Heel Treated by the Wladimiroff-Mikulicz Operation (Di un tumore in regione calcaneare trattato con l'operazione di Wladimiroff-Mikulicz). *Chir. d. organi di movimento*, 1931, xv, 437.

Having obtained a good result from the Wladimiroff-Mikulicz operation in two cases of osteomyelitis and one case of tuberculosis of the calcaneum, Mucci applied the method to a tumor on the right heel of a woman fifty-two years old which started in 1926 as a small ulcerated area and had been operated upon unsuccessfully several times.

At the time the patient was operated upon by Mucci, a small swelling was present beneath the internal malleolus of the right ankle and a larger swelling in the calcaneal region. Both swellings were painless to pressure, horny hard, and sharply limited. The skin between them was normal. There was no sign of regional glandular involvement and no positive roentgen evidence of skeletal metastases.

A diagnosis of sarcoma (blastoma) of the soft parts of the heel was finally made. In an attempt to preserve the use of the leg, the Wladimiroff-Mikulicz operation with sacrifice of some of the lower end of the leg bones and the bones of the posterior portion of the foot was done. This permitted radical resection of all of the soft parts involved by the tumor. The cut-off surface of the leg bones was attached to the resected proximal surface of the bones of the forefoot, the foot being thus placed in an equinus position so that walking would be possible on the heads of the metatarsal bones.

A few weeks after the operation small secondary tumors appeared in the groin, in the lower third of the left biceps muscle, and on the anterior surface of the left leg. These were excised and their character as secondaries verified. Later, thoracic metastases and symptoms developed. The patient died six and one-half months after the operation without any evidence of a local recurrence in the foot.

The causes of blastoma and the advisability of the Wladimiroff-Mikulicz operation in the treatment of the condition are discussed. KELLOGG SPEED, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

GILL, A. B.: A New Operation for Arthrodesis of the Shoulder. *J. Bone & Joint Surg.*, 1931, xiii, 287.

Arthrodesis of the shoulder is indicated for paralysis of the shoulder provided the muscles which rotate the scapula on the trunk are powerful and there is function of the muscles of the arm and forearm. It may be done any time after the tenth year of age. Its functional results are very satisfactory. The new operation described by the author has been entirely successful in the seventeen cases in which it has been performed. Its advantages are its directness and simplicity and its assurance of bony ankylosis in practically all cases.

A circular incision is made about the acromion $\frac{1}{2}$ in. below its border, and a vertical incision is carried down over the greater tuberosity. The skin flaps are turned back and the capsule exposed by cutting away the upper portion of the deltoid fascia. The capsule is freely cut away from the glenoid fossa to within an inch of its humeral attachment. The acromion is denuded of periosteum and soft tissues on its inferior and superior aspects, and the cartilage and ligaments are removed from the glenoid process and the head of the humerus. A thin anterolateral portion of the head of the humerus is then reflected outward and a small wedge of bone, with its base

upward, is removed from the remainder of the humeral head. The arm is abducted to no more than 45 degrees in relation to the vertebral border of the scapula, the end of the acromion is inserted into the wedge in the humerus, and the fascia and capsule are sutured so that the two bones are drawn firmly together. The arm is then immobilized in a plaster cast which includes the trunk down to the pelvis.

After from twelve to fourteen weeks the cast is removed and use of the arm is begun. If abduction has not been over 45 degrees, the patient will be able to reach his mouth and can carry the arm hanging straight down without bending the trunk.

When the operation is done for tuberculosis of the shoulder joint, the part which attempts to secure fusion of the humerus and glenoid should be omitted.

CHESTER C. GUY, M.D.

JUVARA, E.: Resection of the Knee (A propos de la résection du genou). *Bull. et mém. Soc. nat. de chir.*, 1931, lvii, 270.

Juvara performs from 5 to 8 resections of the knee annually to remedy attitudes of the limb which are incompatible with walking, the results of quiescent tuberculosis or of gonorrhœal, osteomyelitic, or traumatic arthritis. In the 200 cases he has treated he has obtained perfect results. His rule is always to resect the articular extremities very conservatively. He preserves the patellar ligament, obtains temporary synthesis of the bone ends by the use of nails, dissects the fungous synovial tissue with the bistoury as completely as possible, and rounds off the articular extremities.

The technique used in his last 36 cases is described in detail. Its advantages are summarized as follows:

1. The bone ends, freshened in curved surfaces, fit solidly.
2. The curved cutting reduces the shortening of the limb to the minimum.
3. Reduction of all flexion of the segments of the limb is effected easily by simple rolling of the femoral extremity without disturbing the contact of the freshened extremities.
4. By the temporary synthesis with nails, fixation of the bone ends is assured in every direction. The nails act as drains and are easily withdrawn when they have served their purpose.
5. Preservation of the patellar tendon and the patella insures a powerful grip of the quadriceps tendon on the femorotibial bony mass, and gives the knee a more normal appearance.
6. In a young subject the epiphyseal cartilages are completely or largely protected even on the tibial extremity by the curved shape.
7. Reconstruction of the knee joint can be done later if desired as the continuity of the quadriceps with the tibia is preserved through the patella and its tendon.

The last two cases operated on by Juvara are reported. In both, an orthopedic resection was done. The operation was difficult as the bone ends were

fused at an angle by a powerful bony mass. In one case there was a fracture of the leg which had consolidated but a fistula was caused by sequestration of the pointed extremity of the upper tibial fragment. PAGE.

FRACTURES AND DISLOCATIONS

Freund, E.: A Special Change in Enchondral Ossification in Certain Cases of Congenital Dislocation Treated by Non-Operative Reduction and Immobilization (Sopra un'alterazione particolare dell'ossificazione enchondrale in qualche caso di lussazione congenita trattato con riduzione incruenta et immobilizzazione). *Chir. di organi di movimento*, 1931, xv, 563.

Quite frequently when the period of immobilization is finished after non-operative reduction of dislocation of the hip and the plaster cast in Lorenz' second position is taken off the roentgenogram shows narrow stripes in the juxta-epiphyseal part of the neck of the femur which sometimes extend from the greater trochanter to the median pole of the neck. Generally there are two linear shadows with a distance between equal to that between the proximal line and the epiphyseal cartilage. These lines are seen only in cases in which a plaster cast has been applied. In cases of unilateral immobilization they are not seen on the opposite side.

The author reports four cases and tries to explain the lines. In his opinion the lines correspond to the two phases of immobilization in the plaster cast. The distance between them corresponds to the first phase of immobilization, that is, the three months in the first Lorenz position, and the distance between the epiphyseal cartilage and the second line, to the three months in the second Lorenz position. The lines are a result of a disturbance in the physiological course of enchondral ossification. After reduction, the organism responds very sensitively to immobilization. There is probably a complete arrest of enchondral ossification and a lamella apposed to the diaphyseal surface of the epiphyseal cartilage is formed. This arrest is transitory. It may persist only for the first week of immobilization, ossification then beginning again. The bone lamella formed in the meantime is then displaced downward as the renewed ossification produces bone immediately below the epiphyseal cartilage. Apparently the organism is able to adapt itself to the unphysiological condition of immobilization. When the apparatus is changed at the end of three months and the limb put in Lorenz' second position, there is another disturbance of ossification and a second line is formed.

This is very similar to what occurs in certain cases of rickets in which periods of active ossification are followed by periods of interruption of growth. However, in rickets it is an internal factor of metabolism which causes the disturbance, whereas in immobilization it is an external factor.

In the second and third of the author's cases the limb was put at once in Lorenz' second position and

there was only one dense line, there having been only one disturbance of growth. Evidently mere renewal of the cast without a change in position does not cause enough disturbance to show in the roentgenogram. In the fourth case there were dense lines before immobilization. The predisposition to the formation of such lines was increased by the immobilization for when the cast was removed at the end of the three months in Lorenz' second position all of the juxta-epiphyseal part of the neck of the femur was occupied by a dense broad shadow.

ANDREW G. MORGAN, M.D.

Young, C. S.: The Mechanics of Ambulatory Treatment of Fractures of the Clavicle. *J. Bone & Joint Surg.*, 1931, xiii, 299.

The ambulatory splint may be used for immobilization after the reduction of incomplete (greenstick) fractures of the clavicle, complete transverse fractures with interlocking serrations, and complete fractures with internal fixation. It may be employed also in other types when the patient is a poor surgical risk. It is not satisfactory in common oblique fractures at the junction of the medial and outer thirds with downward displacement of the lateral fragment. The author discusses the mechanical forces acting on the displaced fragment and concludes that to hold this fragment in position a force directed upward is necessary. He obtains such a force by the application of a well-fitting and thickly padded body-and-arm cast supported below by the iliac crest of the injured side. The humerus is flexed 15 degrees, abducted 25 degrees, and rotated inward 10 degrees. The elbow is flexed 90 degrees, and a plaster bar is inserted between the elbow and body cast. The cast is made rigid by a flat metal strip incorporated within it which extends from the occiput to the sacrum and is bent to allow the head to project posteriorly.

This treatment has been used with satisfactory results in ten cases—four of greenstick fracture and six of complete fracture. In the latter, preliminary open operations with internal fixation by intramedullary beef-bone grafts were performed before the cast was applied. The time required for the application of the cast is offset by the small amount of attention required in the follow-up treatment and the assurance of positive immobilization.

CHESTER C. GUY, M.D.

Voncken, Demonie, and Ory: Six Cases of Dislocation of the Semilunar Bone (Six cas d'enucleation du semi lunaire). *Bull. et mém. Soc. nat. de chir.*, 1931, lvii, 160.

In each of the six cases of dislocation of the semilunar bone reported in this article the authors used an individual method of treatment. In all, a satisfactory result was obtained.

Dislocation of the semilunar bone is usually produced by a fall or a blow on the hand in hyperextension combined with a certain degree of radial deviation and pronation.

Recent dorsal dislocation of the os magnum is quite easily reduced by external maneuvers. Dislocation of the os magnum with dislocation of the semilunar bone, fracture of the scapoid, and displacement of the fragments generally requires operation. In two cases of this type the authors found it necessary to extirpate the semilunar bone and a fragment of the scapoid. In a case in which the semilunar bone was displaced outward, Demonie was able to reduce it after incising the annular ligament of the carpus and separating the flexor tendons. Opening of the synovial membrane was not necessary. In these three cases an anterior approach was used. The dorsal route is seldom indicated. In old dislocations, operation is indicated only in cases with nerve compression and functional disturbances.

The excellent functional results obtained in the authors' cases are attributed to the immediate operative treatment followed by early active physiotherapy. PACE.

Boorstein, S. W.: Compression Fracture of the Spine. *Am. J. Surg.*, 1931, xlii, 43.

Boorstein states that 45 per cent of a large series of fractured spines treated at Fordham Hospital, New York, were of the compression type. He reviews forty-nine cases. In this series the compression fracture was caused by both direct and indirect violence. The direct trauma was a forced hyperflexion of the spine, and the indirect force a violent contraction of the extensor muscles of the back which, in many cases, led to complete fractures of the fourth and fifth lumbar vertebrae. The fractures occurred most frequently in the dorsolumbar and upper lumbar regions.

The most constant signs of the fracture were limitation of motion, persistent weakness of the back, the projection of one or more spinous processes, and local tenderness over the kyphos.

The prognosis became more unfavorable the nearer the fracture approached either the base of the brain or the foramen magnum.

The author emphasizes that both lateral and anteroposterior roentgenograms should be made. In addition to the roentgen findings, the diagnosis should be based on the history of the injury, the localized tenderness and persistent pain in the spine, the weakness and deformity of the spine, and pain from the nerve roots with or without definite symptoms of pressure on the cord.

Early treatment must often include measures to combat shock. It is essential to have accurate knowledge of the function of the kidneys within the first twenty-four hours. The author recommends complete recumbency for from eight to ten weeks followed by gradual resumption of activity with support by a well-fitting jacket or brace for seven or eight months longer. The process of healing should be checked by roentgenograms. With regard to cases presenting paralysis, Boorstein quotes Elberg who stated that the only cases of fresh fracture of the spine in which operative interference

may be indicated are those in which, in addition to partial loss of function, there is evidence in the roentgenograms of a marked deformity of the spinal canal with pressure upon the spinal canal by dislocated bone or bone fragments, and the rare cases in which severe root pains are caused by the pressure of dislocated bone upon one or more sensory roots. For late cases in which the pain persists and the patient must return to strenuous labor, Boorstein recommends a fusion operation.

PAUL C. COLONNA, M.D.

Toro, R. H.: The Treatment of Diaphyseal Fractures of the Femur in the Hospital of San José, Bogotá (Tratamiento de las fracturas diafisarias del fémur en el hospital de San José). *Reperi. de med. y ciruj.*, 1930, xxi, 573.

The methods of treating diaphyseal fractures of the femur which are used at the San José Hospital, Bogotá, Colombia, are of two types—the orthopedic and the surgical. The former include early mobilization and the classical method, and the latter, open operation with simple reduction and open operation with osteosynthesis. On the basis of thirteen cases, which are discussed in detail, Toro reaches the following conclusions:

1. Continuous extension is the treatment indicated in closed fractures with slight deviation and overriding.

2. In cases of old fractures which are poorly consolidated, open operation is necessary and should be followed by the use of a supporting apparatus.

3. Open operation with osteosynthesis should be employed for fractures with marked overriding and deviation and, in general, those which are irreducible.

4. Open infected fractures should be treated surgically, but never with the use of an apparatus or by osteosynthesis.

5. In therapeutic fractures plaster does not possess the inconveniences which render it unsuitable to accidental fractures and may be used for reduction and support.

6. Continuous extension with suspension should supplement all forms of treatment because, while it functions in the same way as a supporting apparatus, it allows active movement of the joints of the fractured member and thereby favors complete anatomical and functional restitution.

WILLIAM W. WHITELOCK, Ph.D.

Lee, H. G.: Fractures of the Tuberosities of the Tibia. *New England J. Med.*, 1931, cciv, 583.

Fractures of the tuberosities of the tibia are infrequent. To prevent disturbances of leg function it is extremely important that they be recognized early and properly treated. They are most common in males of middle age, and are due to either direct or indirect violence. Many are produced by falls in which the subject lands on his feet. Although the body weight is normally transmitted through the internal tuberosity, in falls the leg is usually abducted and the force is applied particularly to the

external tuberosity. The fragment tends to be displaced outward and downward and tilted. The displacement is usually slight, but any deformity of the articular surface disturbs the normal tibiofemoral relation and changes the alignment of the joint. Disturbance of joint alignment may result later in genu valgum or varum or arthritis, and is particularly apt to complicate fractures of the internal tuberosity. When the patient is young and complete reduction is obtained, the prognosis is good, but when the patient is old, when there is a co-existing osteo-arthritis, when reduction is incomplete, or when there is associated damage to the meniscus or joint capsule, the prognosis must be guarded.

Treatment should be preceded by a careful study of stereoscopic roentgenograms. If the displacement is outward rather than downward and of slight to moderate degree, conservative methods such as the use of the Thomas wrench or the padded hammer are usually sufficient for reduction. If these are not successful or if the injury is more severe, open operation with accurate replacement of the fragments should be performed without delay and screws, nails, or plates should be employed to hold the fragments in position. After the reduction the leg should be kept in a cast for from four to six weeks. At the end of that time, motion should be started.

The author emphasizes especially the importance of accurate reduction of fractures of the internal tuberosity.

CHESTER C. GUY, M.D.

Laureati, L.: Posterior Marginal Fracture of the Lower Epiphysis of the Tibia—Destot's "Posterior Malleolus" (Sulla frattura marginale posteriore—"malleolo posteriore" di Destot—dell'epifisi tibiale inferiore). *Chir. di organi di movimento*, 1931, xv, 552.

According to Destot's description, the joint surface of the tibia seen in profile shows an irregular curvature. The anterior two thirds have a cylindrical curvature with a radius of 28 mm., while the posterior third is flattened and therefore has a smaller radius. It is to the posterior third that Destot gave the name "posterior malleolus." This part prevents the foot from becoming dislocated backward. As the calcaneus is inclined backward, the astragalus would slide back when sudden force is brought to bear upon it if it were not prevented from so doing by the posterior malleolus. The posterior malleolus is not mentioned in the classical textbooks of anatomy because it has no special arrangement of the bone trabeculae like the other malleoli and it shows no independent center of ossification. Testut's *Anatomy* says only that the posterior surface of the lower end of the tibia is convex like the anterior surface and presents a small groove through which runs the tendon of the flexor longus hallucis.

The case of posterior marginal fracture of the posterior malleolus which is reported by the author

was that of a man fifty-five years of age who slipped on a stairway and fell with all his weight on his right foot. It was assumed that the accident caused a bimalleolar fracture, and the foot was immobilized at a right angle without roentgen examination. After four months, the foot, ankle, and lower part of the leg became oedematous whenever walking was attempted. The right foot was rotated outward. Movements of extension and flexion were limited to two-thirds normal, and rotation, abduction, and adduction were abolished completely. The right heel projected farther back than the left. When the anterior margin of the tibia was followed down, a depression was found at the lower end. There was marked atrophy of the leg.

Roentgen examination showed a fracture of the posterior malleolus with backward subluxation of the astragalus. The astragalus rested on the posterior part of the joint surface and on the fracture callus, while the anterior part of the joint surface of the tibia had no contact with the astragalus. There had been also a fracture of the distal end of the diaphysis of the fibula. Between the internal malleolus and the astragalus the roentgenogram showed two small shadows which were due to calcification of the lacerated ligaments.

Fracture of the posterior malleolus rarely occurs alone. It is usually associated with fracture of one or both of the other malleoli, but it is a pathological entity which may dominate the picture of injury to the ankle. When there is backward dislocation of the heel and when a fracture in the region of the ankle is difficult to reduce and keep in position, fracture of the posterior malleolus should be suspected and a roentgen examination should be made. Enlargement of the internal malleolus is also suggestive of this form of fracture. The symptoms are more marked in late cases. There is evident subluxation of the foot, the heel appears to be elongated, the anterior margin of the tibia is prominent, and when the margin of the fibula is followed down it is found to form an angle open backward. The retromalleolar grooves are much larger than normal. The patient feels intense pain when he puts his heel on the ground and walks with the foot in an equinus position. In addition to the backward dislocation of the foot there is a certain degree of valgus or, more rarely, varus.

When fracture of the posterior malleolus is associated with fracture of the other malleoli the prognosis with regard to secondary deformity is much less favorable. The condition may cause traumatic arthritis, chronic oedema, and various disturbances of the trophism of the leg. The loss of the posterior support of the foot results in displacement of the center of gravity and a new functional adaptation of the foot which greatly reduces the amplitude of its movements.

The treatment consists in reducing the astragalus to its proper position and immobilizing the foot. To replace the astragalus downward, traction should be exercised on the foot with a certain degree of

force and should be followed by alternate movements of extension and flexion. The foot should be immobilized in forced dorsal flexion at an acute angle instead of a right angle to the leg.

AUDREY G. MORGAN, M.D.

Babini, R.: Dislocation and Fracture of the Tarsal Scaphoid and Its Treatment (Lussazione e frattura dello scafoide tarsico e suo trattamento). *Chir. d. organi di movimento*, 1931, xv, 397.

A case of astragaloscapoid dislocation with fracture of the scaphoid is reported by the author on account of the rarity of the condition and the lack of a uniform treatment for it. Babini considers the dislocation of the major fragment of the bone to be of greater importance than the separation of a small fragment.

The patient whose case is reported was a man twenty-nine years old who fell a distance of 6 meters, landing on his feet. After the fall he was unable to walk, and examination revealed a fracture of the left calcaneum and the right scaphoid with the large fragment dislocated upward and backward into the

head of the astragalus. The small fragment, which consisted of only the tubercle, remained in place. All of the foot movements were restricted and painful.

Reduction was accomplished by traction on the forefoot and countertraction on the heel and a plaster dressing applied, but the control roentgenogram showed that the dislocation had recurred.

Operation was performed four days later under ether anaesthesia. The two fragments of the scaphoid were exposed through a 10 cm. incision on the dorsum of the foot which was crossed at the middle by a transverse incision. Reduction was again easily accomplished, but was again followed by immediate recurrence. The two fragments of scaphoid were sutured with silk and remained reduced. The reduction was verified by roentgen examination through the plaster dressing.

After three months there was cure with no deformity and no difficulty in walking.

The article is concluded with a discussion of the mechanism of injuries of this type.

KELLOGG SPEED, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Labbé, M.: Diabetic Arteritis (*L'artérite diabétique*).
Presse Méd., 1931, xxix, 257.

Since the discovery of insulin, statistics show that coma as a cause of death in diabetes has decreased and arteritis has increased in importance. Diabetic arteritis may involve any of the arteries. According to Joslin, the arteries of the heart are affected most frequently and those of the brain third most frequently.

Diabetic arteritis differs from senile arteritis in its early occurrence and the nature of its histological changes. It differs from syphilitic arteritis in its localization and the coats of the artery it involves. Syphilis attacks especially the aorta and the large arteries, whereas diabetes affects especially the small arteries of the limbs. Syphilis causes a panarteritis in which all of the coats of the artery are affected equally whereas diabetes involves only the intima.

There is no disease in which arteritis is more frequent than in diabetes. In the latter condition it occurs very early. Its frequency is not proportionate to the severity of the diabetes. It is less common in diabetes with nitrogen denutrition, which occurs most frequently in young persons, than in benign diabetes without denutrition, which occurs at every age, but is most frequent in persons over thirty years old.

Diabetic arteritis requires a certain time to develop. Its incidence is highest in older patients. Diabetes seems to cause early aging of the organism. Diabetic arteritis affects especially the limbs, usually the lower limbs. It is possible that the diet imposed on diabetics may favor the development of atheroma. Deficiency of carbohydrates and their replacement with fats may explain the hypercholesterinemia of diabetics and the deposit of cholesterol in the intima which plays such an important rôle in the vascular atresia.

The first symptoms of diabetic arteritis are slight sensory disturbances such as numbness of the extremities, sensations of cold, formication, and cramp. These often occur at night. Later there are attacks of ischemia with severe pains and sensations of constriction. During the day there is intermittent claudication. Arterial pulsations cease first in the dorsalis pedis artery and then in the posterior tibial and the popliteal arteries. In the femoral artery in Scarpa's triangle they are sometimes lessened in strength, but are rarely abolished. The same examination must be made of the arteries of the upper limb. The relative diminution in amplitude of the oscillations in the lower limbs is a first sign which should not be overlooked. Oscillometry, whatever

its deficiencies, is the best means of appreciating disturbances of arterial circulation in a limb.

One of the most satisfactory procedures for the study of the vessels in diabetics is roentgenography of the arteries in the living. The arteries of diabetics are often and early calcified. They are calcified before they are constricted. However, calcification is of less value in the prognosis than the findings of oscillometry. Sicard believes that the injection of lipiodol locates an arterial obliteration with more precision than palpation of the artery or oscillometry. However, this method has numerous sources of error.

Examination of the arteries must be supplemented by examination of the peripheral nerves. As conservation of tendon reflexes in certain cases indicates integrity of the nervous system, the disturbances of sensibility must be attributed to the blood-vessel lesions.

The author reports five cases of painful diabetic arteritis.

In diabetic arteritis the calcification of the arteries is much more marked than in other types of arteritis. The increase in the magnesium in the arterial walls is about the same as the increase in the cholesterol, but less than the increase in the calcium.

The author outlines the pathogenesis of arteritis in diabetes as follows:

The blood which is abnormally charged with glucose chronically irritates the intima and causes it to become thickened and slightly inflamed. Later, the cholesterol, which is in excess in the blood of diabetics, penetrates the intima and is there deposited. The deposits may be acted upon by therapy which reduces the cholesterinemia. Insulted into the intima and swelling it, the cholesterol is a primary factor in the production of circulatory disturbances. It constricts the lumen of the vessel and is responsible for the ischemia and gangrene. Spasm and thrombosis play scarcely any rôle in the mechanism of arterial stenosis in diabetics. As there seems to be no relation between the calcium content of the arteries and the blood calcium, a low-calcium diet is unnecessary. PAGE.

Lopez, P.: The Treatment of Varices with Ether
(*Traitement des varices par l'éther*). *Bull. et mém. Soc. de chirurgiens de Paris*, 1931, xiv, 57.

The author states that the ideal sclerosing agent for the treatment of varicose veins must be a non-toxic, antiseptic solution which will penetrate with sufficient force to reach the finest venous channels and accomplish the sclerosis with one injection. He believes that ether meets the requirements.

His technique of injection is simple. An elastic bandage is firmly applied just above the varices and

from 1 to 1½ c.cm. of ether is injected at each of two sites. The ether soon becomes gaseous, giving a characteristic tympanitic sensation to the finger tip which persists from fifty to sixty minutes. At the end of this time the constricting bandage is released. The patient is then kept in the recumbent position for from four to eight hours.

A hard non-tender cord is noted at the site of the varicose vessels after the injection, but disappears in a few months.

Untoward results have been infrequent. They consist of small sloughs due to reflux of the ether from the needle hole or its inadvertent injection about the vein.

Lopez reports on twenty-two cases in which the method described was used successfully. The first one was treated six months ago.

Histological sections of veins taken thirty, fifty, and eighty days after the injection of ether showed progressive organization of the thrombus.

JAMES B. MASON, M.D.

De Takáts, G.: Causes of Failure in the Treatment of Varicose Veins. *J. Am. M. Ass.*, 1931, xvi, 1111.

The author classifies the causes of failure in the treatment of varicose veins into seven groups: (1) mistakes in the diagnosis, (2) mistakes in the establishment of the indications, (3) mistakes in the type of treatment, (4) mistakes in the technique of injections, (5) mistakes in the selection of the solution to be injected, (6) mistakes in the measures taken to prevent or treat untoward reactions, and (7) mistakes in the after-treatment and follow-up of the patients.

MISTAKES IN DIAGNOSIS

If every dilated vein in the lower extremities is regarded as a varicose vein, grave errors may occur. A group of well-defined multiple arteriovenous communications may give rise to an erroneous diagnosis. In these, no pulsation is visible or audible as the communications are very small. The condition is congenital, becomes manifest in early life, and progresses continuously. The affected limb is warm and may be larger than the other leg, and the blood in the dilated veins is arterial in character, being light red. Such cases require extensive surgery with ligation of the feeding arteries and extirpation of the dilated veins.

Buerger's disease, which affects arteries as well as veins, not infrequently starts with a spontaneous phlebitis which subsides and recurs. The recurring attacks may result in dilatation of the veins with valvular insufficiency. Unless attention is paid to the absence of a pulse, the dependent rubor, and the characteristic intermittent claudication, the mistake of injecting such veins with sclerosing solutions may be made.

An error which is probably more frequent than any other is treatment of veins when the complaints originate in another source. Complaint of an ache

in the calf, the knee, or the hip with less emphasis on the characteristic site of pain at the arch and the calluses may lead the practitioner to attribute the symptoms partly or solely to varicose veins. Arthritis deformans of both knees in elderly persons continues to cause persistent pain even after the obliteration of varices. Any orthopedic condition such as genu valgum, sacro-iliac pain, or spondylolisthesis, should be investigated if the pain radiates to the extremities.

MISTAKES IN INDICATIONS

In certain cases the injection treatment is contra-indicated.

Systemic diseases. It is a mistake to treat varicose veins by injection when hyperthyroidism, active tuberculosis, or even an acute cold is present. A complete examination is important. The case of a young girl with slight evening rises in the temperature who died of miliary tuberculosis six weeks after injection treatment for varicose veins shows that latent tuberculosis may be activated by the injections.

Mechanical obstruction. In the varicose vein the flow of blood is reversed without a true obstruction to the backflow. Obliteration of such dilated veins restores the venous circulation to normal. However, if the superficial veins are dilated because of a true obstruction, as in the presence of pregnancy, an abdominal growth, or pelvic thrombi, the dilatation is compensatory and the treatment not warranted unless it can be shown that the secondarily dilated veins have also become incompetent. The most frequent mistake is the injection of compensatory dilations in the presence of oedema. Oedema always signifies insufficient venous return. Injections into oedematous legs usually increase the oedema not so much because they obliterate venous channels, but because they activate a latent deep phlebitis.

Latent infection. A low-grade latent infection is present in many patients who have never had an acute phlebitis, a massive thrombosis, or an infected ulcer. When injection treatment is given into an area of resting infection it may suddenly set up an acute phlebitis with perivenous exudation and the formation of massive thrombi. To decrease such acute flareups the following rules must be observed:

1. Nothing should be injected into a vein unless at least three months have elapsed since the subsidence of an acute superficial phlebitis.

2. If the veins are hard and tender to the touch and if phleboliths are palpable, an effort should be made to test for latent infection. Gentle massage, heat, and diathermy are most useful in the detection of latent infection.

MISTAKES IN THE TYPE OF TREATMENT

Incompetence of the entire long saphenous vein calls for preliminary ligation of the vein above the highest palpable point. Unless this is done, the incidence of recurrence will exceed 10 per cent.

This procedure prevents the ascending type of thrombosis from extending into the femoral vein.

In another small but definite group of cases the reflux of blood occurs chiefly through multiple incompetent communications from the deep veins. The Trendelenburg test is doubly positive. Injections in such cases do not give good results, recurrence being frequent. The logical treatment is wide radical excision of all dilated veins.

MISTAKES IN THE TECHNIQUE OF INJECTIONS

If the bevel of the needle is too long, the vein may be easily transfixed. If the bore of the needle is too large, leakage may occur after the needle has been withdrawn. If the vein is not emptied of blood, too much dilution takes place. Unless the vein is compressed below and above the injection with two fingers or compressors, the solution is carried away too soon. If the needle is not quite in the vein, the solution injected beside the vein may cause necrosis. Unless pressure pads are applied after the injections, the thrombi will be large and soft or no thrombi will be formed. If the patient is told to go to bed after the treatment and is immobilized for any length of time, the danger of embolism is greatly increased. If the legs are not bandaged for about three weeks after completion of the treatment, the recently organized thrombi may canalize and early recurrence may take place.

MISTAKES IN THE SELECTION OF THE SOLUTION TO BE INJECTED

The salicylates and quinine are often poorly tolerated. Nevertheless it must be admitted that, in difficult cases which resist other solutions, the use of 2 c. cm. of a 10 per cent solution of quinine-urethane divided into three or four parts is most successful.

The best solution is a mixture of 50 per cent dextrose and 30 per cent sodium chloride solution. The first is too bland and the second too irritating to be used alone. A mixture of equal parts combines the advantages and lacks the disadvantages of both.

The mixture of dextrose and sodium chloride is used in amounts of from 5 to 10 c. cm. at one injection. The amount of the solution should be commensurate with the size of the varix. Fine-walled veins require less and may be injected with pure dextrose. Large sacular varices with thickened walls sometimes require pure sodium chloride. For general use, however, the mixture is most satisfactory.

MISTAKES IN MEASURES TO PREVENT AND TREAT UNTOWARD REACTIONS

Sloughs. Every physician who uses the injection treatment must be fully aware that the solution, if deposited outside the vein, causes necrosis of the tissues. Depending on the type and amount of the solution used, there will result a small painful perivenous infiltration which is absorbed sponta-

neously, a large hard mass which breaks down easily but may be prevented from doing so, or a frank gangrenous ulcer with a large necrotic mass around it. If a slough were caused whenever a solution is injected outside the vein, few physicians would use the injection treatment. A few drops of bland solution will cause only some burning and a slight inflammatory reaction which does not result in breaking down of the skin. When needles larger than a No. 23 or 24 gauge with a long bevel are used, leakage occurs easily. Moreover, some of the solution may infiltrate the wall of the vein and cause destruction. When a growing hematoma is seen, the injection must be stopped immediately. When the patient complains of intense burning at the site of the injection and a ballooning out and blanching of the skin are noted, the danger of a massive necrosis is great. If from 5 to 10 c. cm. of the patient's own blood are injected immediately into the blanched area, a frank gangrene may sometimes be prevented. Nevertheless, a hard painful mass may persist for weeks. The absorption of the mass can be hastened by the use of a 30 per cent mercury ointment. Pressure pads should not be employed above such areas as they will further interfere with the circulation.

Cramps. With the exception of solutions of quinine, all drugs used for injection treatment cause cramping. In the cases of women who are sensitive, the cramping is sometimes unbearable. It is a serious mistake to add procaine hydrochloride to the injected solution as procaine given intravenously is very toxic, even in minimal quantities. At present there is no sure means of alleviating the cramp. It is possible that the cramp is helpful in keeping the solution longer in place. The cramp ceases in three or four minutes.

Cardiovascular reactions. When the patients are anxious, particularly before the first treatment, they must frequently be reassured and the injections should be given only in the horizontal position. Young women with an easily fluctuating blood pressure faint easily when the needle is inserted. The fainting is mostly a psychic reaction. Reactions in the form of pain in the region of the heart, palpitation, and dizziness occurring a few minutes after the injection are of a different character. Patients suffering from angina pectoris may easily develop an attack after the injections. The diagnosis of such a condition contra-indicates the injection treatment.

MISTAKES IN THE AFTER-TREATMENT AND FOLLOW-UP OF PATIENTS

Patients should not be immobilized during or after the treatment. The only time when embolism is to be feared is when the patient with varicose veins must stay in bed for a prolonged time.

Bandaging of the leg during and after the treatment for three weeks is beneficial but not necessary. It seems to bring about the formation of smaller and firmer thrombi. If the venous pressure is reduced,

the fresh thrombus organizes more rapidly and is not subjected to back-pressure.

JOHN J. MALONEY, M.D.

Howard, N. J., Jackson, C. R., and Mahon, E. J.: Recurrence of Varicose Veins Following Injection: A Study of the Pathological Nature of the Recurrence and a Critical Survey of the Injection Method. *Arch. Surg.*, 1931, xxii, 353.

Of sixty-six patients treated for varicose veins by the injection of 20 per cent sodium chloride, the authors were able to re-examine forty-nine a year or more after the treatment. Forty-eight of the forty-nine re-examined showed recurrence. Four others are known to have had an early recurrence but could not be located after a year. The incidence of recurrence was 79 per cent in the cases of all patients treated and 98 per cent in the cases of those followed for a year or more.

Recurrence of veins thrombosed by injection was found to take place by recanalization, a natural pathological response to thrombosis.

The authors believe that, especially in the presence of incompetent saphenous or perforating valves, interruption of the continuity of the vein by excision is essential for more permanent results. They suggest indications for the combination of excision with injection.

SAMUEL KAHN, M.D.

Kern, H. M.: A Solution of Dextrose and Sodium Chloride for Obliterating Varicose Veins. *Ann. Surg.*, 1931, xciii, 697.

Experimental injections of solutions were made into the external jugular veins of 28 dogs. In no case was there migration of the resulting thrombus.

The author discusses the value of a solution of dextrose (50 per cent) and sodium chloride (30 per cent) in the injection treatment of varicose veins. He describes in detail the preparation of the solu-

tion, the mixing dosage, and the technique of injection.

In 464 cases in which dextrose-sodium chloride solution was used almost exclusively and the treatment was completed, there were only 2 complications of any consequence after the injection. A careful follow-up of 100 of the patients showed the incidence of recurrence of the varices to be 10 per cent. In 7 per cent, the recurrence was only partial. Recurrences develop early and are usually attributable to incomplete thrombosis.

SAMUEL KAHN, M.D.

Bernheim, B. M.: Arteriovenous Anastomosis: Follow-Up After Eighteen Years of "Successful Reversal of the Circulation in All Four Extremities of the Same Individual." *J. Am. M. Ass.*, 1931, xcvi, 1296.

The author reports the case of a woman in whom arteriovenous anastomoses were done for gangrene of all four extremities due to early Raynaud's disease eighteen years previously. In one extremity an end-to-end anastomosis with ligation of the proximal end of the vein was done. The operations were followed by reversal of the circulation and cessation of the spread of the gangrene. The patient continued to have pain in the extremities, but this was controlled by morphine. Sixteen years after the original operations the pain increased and she developed gangrene of several toes on each foot and of a finger on the right hand.

At present her general condition is excellent in every respect except that she still has some pain in the extremities. The heart is not enlarged. The systolic blood pressure is 100.

The author concludes from this case that arteriovenous anastomosis should be considered in the treatment of certain vascular disorders.

SAMUEL PERLOW, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Cope, V. Z., Fleming, A., Mitchiner, P. H., Denlans, T. H. C., and Others: Discussion on the Indications for, and the Value of the Intravenous Use of Germicides. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 805.

COPE defines germs as pathological micro-organisms, and germicides as any substances of known and fixed chemical composition which will kill germs either directly, when brought into contact with them, or indirectly, by unfavorably affecting their environment in the body.

Micro-organisms may be of animal or vegetable nature, i.e., protozoa or bacteria. The best results from the intravenous injection of a germicide have been obtained in the use of arsenic compounds in spirochetal and trypanosome disease, antimony compounds in infections with Leishman-Donovan bodies, emetine in infections due to the entamoeba histolytica and quinine compounds in malaria. The intravenous use of emetine and quinine compounds is necessary only in urgent cases. Recent investigation has shown that, *in vitro*, a solution of 1:5,000,000 of emetine in a simple liquid medium is lethal for all strains of entamoeba histolytica.

In anthrax, salvarsan has been employed. Cope believes there is experimental and clinical support for this treatment. In infections with the pneumococcus produced in mice, Morgenroth was able to save 50 per cent of the animals by injections of optochin. In clinical cases, however, the use of optochin has been abandoned because it sometimes causes blindness and it does not cure the infection. In leprosy, remarkable results have followed the intravenous injection of the sodium salts and the ethyl esters of hydnocarpic and chaulmoogric acid. These drugs should be considered indirect germicides.

The last group of germicides considered by Cope are solutions of the hypochlorites, perchloride of mercury, mercurochrome, and various aniline dyes. According to Cope's experience, the drugs most likely to be of benefit in septic infections are the arsphenamines.

FLEMING cites Wright's definition of germicide—a substance which will enter into destructive combination with a microbe. To kill germs present in the circulating blood with a germicide it must be possible, with safety, to obtain the proper concentration of the drug in the blood and to maintain this concentration for a long enough period.

In the evaluation of the results obtained by the injection of a chemical into the blood for the destruction of germs, the normal germicidal power of

the blood has been found of considerable importance. The direct germicidal power of a chemical in the blood can be tested on de-leucocytized blood, which has no germicidal power. By such tests, Fleming found that eosol inhibits streptococci only in a concentration of 1:2. Therefore it would be necessary to inject 5 liters rather than the 150 c.cm. recommended. If monsol were employed on this basis, 2½ liters of a 1 per cent solution would be necessary, and if quinine hydrochloride were used, the concentration required would necessitate the use of at least 80 gr. Mercurochrome in the concentration which is obtained with the usual dose has no power to prevent the growth of staphylococci when it is added to de-leucocytized blood. Experiments with mercurochrome in a 1:6,000 concentration in de-leucocytized blood showed a free growth of bacteria while in normal blood without the addition of mercurochrome these bacteria did not survive. With regard to flavine it was demonstrated that, even when the concentration is lethal to bacteria, the drug disappears from the blood so rapidly that the concentration cannot be maintained.

Gentian violet, which has a powerful inhibitory effect on the growth of Gram-positive bacteria, is much the same in its action as flavine. Arsenical preparations of the neosalvarsan type, particularly novarsenobillon, can be injected intravenously in such quantities that, when diluted in the blood, a concentration lethal to the hæmolytic streptococcus can be reached. However, it takes six hours to effect the destruction of the streptococci, and the concentration cannot be maintained in the blood stream for that length of time. Colebrook was able to obtain a bactericidal action on hæmolytic streptococci by subcutaneous injections of metarsenobillon. The organic arsenical preparations are the only ones which can act as germicides in the circulating blood and are destructive to the hæmolytic streptococci. They are ineffective against other streptococci. Fleming distinguishes three stages of concentration of the antiseptic as regards its action on bacteria in the blood:

1. An indifferent stage, in which there is no action on either the bacteria or the leucocytes.
2. An anti-leucocytic stage, in which the leucocytes are damaged or destroyed, the bacteria are unaffected, and a more copious growth of bacteria results.

3. An antiseptic stage, in which the leucocytes are destroyed and the bacteria are killed or inhibited.

Fleming next considers the indirect germicidal action of drugs injected into the blood stream. He has found that a hypertonic solution of sodium chloride increases the germicidal power of blood. When a small dose of hypertonic salt solution (50

c.cm. of a 10 per cent solution) is used, there is a slight or no preliminary drop in the germicidal power, but when a large dose is given there is a definite negative phase which lasts for perhaps an hour and is followed by a great increase in the germicidal power lasting for several hours. Fleming concludes that the non-specific rise in the germicidal power induced by certain chemicals which are toxic is just as effectively induced by salt.

Mercuric compounds have a specific action on hæmolytic streptococci, rendering them more susceptible to the normal antibacterial agencies of human blood.

MITCHNER states that most patients with septicæmia who are treated by the intravenous injection of a germicide are harmed rather than benefited thereby. He believes that staphylococcal septicæmia is more apt to be fatal than streptococcal septicæmia. He states that the clinical indications for the intravenous injection of a germicide is the failure of the patient to react to general measures—the absence of leucocytosis.

Following a review of the work of others, Mitchner discusses the intravenous treatment of puerperal sepsis. He regards it as of doubtful value.

BENJAMIN believes that the value of an intravenous germicide must be determined from clinical use.

GARROD says that four investigators besides himself have found solutions of mercurochrome in strengths between 1:50 and 1:400 to be ineffective against the staphylococcus aureus. This is contrary to the findings of Young, White, and Swartz.

FINDLAY states that the more highly differentiated parasites are most easily destroyed by chemical agents in the blood stream. He believes that chemotherapeutic drugs will be found which will stimulate the formation of immune bodies in bacterial disease.

BURNFORD calls attention to the focus of infection and its part in producing a continuous supply of bacteria to the blood stream. He believes that the clinical aspect of blood-stream infection is of greater importance than the findings of laboratory experiments.

W. N. ROWLEY, M.D.

Westerborn, A.: Trendelenburg's Operation for Pulmonary Embolism. *Ann. Surg.*, 1931, xciii, 816.

This is a report of another case in which embolotomy was done successfully at the surgical clinic of the University Hospital of Uppsala, Sweden.

The patient had been in the hospital several days with cholecystitis and had been subjected to cholecystectomy. During the first five days after the operation her general condition had improved, but she continued to have a fever of from 38 to 38.4 degrees C. In this interval she showed no symptoms of thrombosis. On the fifth day she complained of queer sensations in her left leg—"as though something were running in the leg." A few minutes later she became cyanotic, unconscious, and pulseless. The nurse made a diagnosis of pulmonary embolism

and immediately sent her to the operating room. The time between the onset of the symptoms and the beginning of operation was not over four minutes.

The operation was performed without anæsthesia. The second and third ribs were resected and an accidental injury to the pleura was closed with a tampon. The pericardium was opened, a rubber tube placed around the aorta and pulmonary artery for traction and control of bleeding, and an incision from 10 to 12 mm. long made in the pulmonary artery. A large embolus was extracted from each branch of the artery. No other embolus was found, and no thrombotic mass could be withdrawn by suction. The wound was closed with a clamp and the traction released.

The heart showed only fibrillar contractions when it was first seen and was absolutely still when the traction was released. Adrenalin injected into the aorta caused quick restoration of the normal contraction. The wound in the artery was closed, the pericardium sutured, the accidental pleural wound closed, and the skin sutured.

Improvement began immediately upon relief of the obstruction, but the patient did not regain consciousness until she was back in bed with the foot of the bed elevated. Total blindness persisted for two hours. Difficulty in breathing was relieved by aspiration of air from the left pleural cavity. The patient's condition was good all night, but it became acutely worse at 6 a.m., and death occurred at 7:50 a.m.

Autopsy showed a large embolus in the right branch of the pulmonary artery which was somewhat adherent to the wall of the vessel and thrombosis of both femoral veins.

The greatest technical difficulty encountered in the operation is the avoidance of injury to the pleura, but in an emergency such as this it is more important to relieve the obstruction to the circulation as rapidly as possible. The success of the operation in the case reported was due to the immediate diagnosis made by the nurse and the fact that the operation could be performed at once because the necessary instruments were in readiness for such an emergency.

There is always grave danger of new emboli, but the danger is less in cases in which the entire thrombus is detached at once. The possibility of new emboli must be recognized when the postoperative prognosis is considered.

E. S. PLATT, M.D.

Picot, G.: The Rôle of Coagulation of the Blood in the Pathogenesis of Postoperative Phlebitis and Embolism (Du rôle de la coagulation sanguine dans la pathogénie des phlébites et des embolies post-opératoires). *Bull. et. mém. Soc. nat. de chir.*, 1937, lvi, 281.

In 1925, Bloch, struck by the frequency of phlebitis after hysterectomy for fibroma, studied the blood coagulation before the operation. During the last two years Picot has never performed an operation without previously investigating the blood coagulation and bringing it to normal. As indicated by the

method he used, the normal coagulation time varies between seventeen and eighteen minutes.

After a surgical operation there are often variations in the blood coagulation. Subjects with an exaggerated coagulation are especially apt to develop phlebitis. A coagulation time which has been brought to normal by medication usually returns to its first figure as soon as the action of the drug ceases.

Hysterectomy for fibroma is the operation which most favors phlebitis. Phlebitis occurs most frequently in women who are anemic as the result of severe hæmorrhages. Such women have a particularly rapid coagulation. Picot has observed the same exaggerated coagulation in all patients who have had large or repeated hæmorrhages from such conditions as duodenal ulcer and hæmorrhoids.

The observation of several cases has convinced the author that there is a relation between spontaneous embolism and retardation of coagulation. He has therefore come to fear phlebitis when the coagulation is too rapid and embolism when it is too slow. However, this formula is not absolute.

The investigations of Govaert, reported to the Congress of Warsaw, showed that the thrombus is composed of a white thrombus below and a red thrombus above. The white thrombus is formed chiefly by agglutination of the platelets, and the red thrombus by a blood coagulum similar to the ordinary clot. There is a close relationship between coagulation, the number of platelets, and the agglutination of the platelets. Hayem and Barrièr showed that the plasma of the horse coagulates more quickly the larger the number of hæmatoblasts it contains. LeSourd and Pagniez greatly accelerated the coagulation by adding platelets to the plasma. However, it is clearly evident from these investigations that the agglutination of the platelets forms a compact and adherent mass only if the platelets have undergone a sort of transformation which has homogenized them, a "viscous metamorphosis." In blood which has become incoagulable this metamorphosis occurs only if there is infection. Therefore it is possible that, in the absence of infection, it is produced only incompletely or defectively when the blood is only hypocoagulable. It is permissible to assume that under such conditions the white thrombus, which is only slightly adherent, disintegrates and, drawing along the red thrombus which is never very adherent, determines a massive embolism.

On the other hand, coagulation plays an important rôle in the formation of the red thrombus, and it is conceivable that, when the blood is hypercoagulable, the red thrombus may reach dimensions causing extensive vascular obliteration which favors extension of the thrombosis. It may be assumed that the fragments of the latter, in disintegrating, become mobilized. This would explain the embolisms occurring in the course of phlebitis which are rarely massive.

Picot uses injections of "chloro-calcion" and "arkema" pectine to hasten coagulation, and injections

of acid sodium citrate to retard it. The reduction of a twenty-five minute coagulation time to eighteen minutes usually requires four or five days. Of 167 cases in which Picot performed a total or subtotal hysterectomy (in 99 for fibroma) embolism occurred in only 1 and phlebitis in none. The case with embolism is reported. Embolism occurred only once also in 295 cases of acute, subacute, or chronic appendicitis. The case of embolism in this group was that of an aged and obese woman who had 3 attacks in a few weeks and whose coagulation time at first was twenty-four minutes. In 308 cases in which surgery of the stomach, bladder, prostate, or intestines was done the only accident occurred in a man with hernia and appendicitis. Many of the patients had had phlebitis previously and before operation showed marked hypercoagulation. PACÉ.

ANÆSTHESIA

Gaza, von: *The Action of Anæsthetics in Different Solvents* (Die Wirkung der Anæsthetica in verschiedenen Lösungsmitteln). *Zentralbl. f. Chir.*, 1930, p. 2885.

Lipoid therapy (Meyer and Overton) which has brought to light some relationships between the action of local and general anæsthetics and their solubility in water and fatty substances led to a series of experiments in which various anæsthetics in oily solutions and emulsions were employed. Cocaine and novocain were dissolved in olive oil, cod liver oil, and human oil in different concentrations. Experiments with novocain in oil were possible only when the basic salt of the anæsthetic was employed.

It was found that a weak solution of novocain in oil was not anæsthetic. Only with a 2 per cent strength did the solutions of novocain and of tropococaine exert an anæsthetic effect. The explanation is that the oily solution injected into the skin holds the novocain very firmly and releases it very slowly to the surrounding watery fluids. The duration of the anæsthetic effect of these solutions is unusually long (forty-eight hours). KOTT (Z).

Thomson, H. T.: *Spinal Anæsthesia*. *Edinburgh M. J.*, 1931, xxviii, 49.

The author has used percaine anæsthesia in 27 operations on the upper abdomen and 37 operations on the lower abdomen. In 2 cases it failed partially, and in 2 it failed completely. Failures are due to errors of technique. The method is advantageous when an inhalation anæsthetic is contra-indicated. In most cases in which it is employed the operation is facilitated and there are no postoperative complications. Its dangers are vasomotor paralysis, interference with respiration, toxæmia from absorption of the drug into the circulation, and cardiac failure from over-stimulation of a diseased myocardium. In the cases of certain patients it is undesirable because consciousness is not lost and a psychic disturbance may result.

Percaine is a derivative of quinoline. It has a prolonged action, but is free from irritating effects.

It is 10 times stronger than cocaine and 20 times stronger than novocain. A solution of 1 part of percaine in 1,500 parts of a 0.5 per cent saline solution has a specific gravity of 1.003. As this is lower than the specific gravity of cerebrospinal fluid, the direction of gravitational diffusion can be determined. In injecting the percaine the aim is to bathe the anterior and posterior roots. The amount used is dependent on the length of the spine and the height of the anaesthesia desired.

After slow injection of the anaesthetic the patient is placed in the prone position with a slight Trendelenburg tilt for ten minutes and then changed to the supine position. In this way the posterior and anterior roots are well bathed with the anaesthetic. At least fifteen minutes should elapse before the operation is begun. If the blood pressure falls, 1 gr. of ephedrine is given. In the author's cases serious respiratory disturbances were avoided by care to prevent involvement of the origin of the phrenic nerves by the anaesthetic. Pre-operative medication with barbitol will control anxiety. In the author's cases there were no deaths attributable to the anaesthetic.

In the discussion of this report, FRASER stated that he agreed with Thomson's conclusions.

GRAHAM said that in the 161 cases of abdominal conditions in which he had used spinocaine anaesthesia, the results were satisfactory in 75 per cent. The best results were obtained in operations on the lower part of the abdomen. In gastric con-

ditions the anaesthesia did not seem to give sufficient relaxation for careful examination; handling of the stomach was apt to cause pain, nausea, and retching.

BROWN discussed the use of spinal anaesthesia induced with spinocaine especially in operations on the lower part of the abdomen. He believes this type of anaesthesia is of definite value for patients with acute intestinal obstruction, a large ventral hernia, or prostatic enlargement who are poor surgical risks.

CHIENE reviewed the history of the development of this type of anaesthesia.

STURROCK stated that he had employed spinocaine in 47 cases, in 70 per cent of which an operation was performed on the lower abdomen. The results have led him to continue its use.

STUART reported that he had used tropacocaine for several years with success, but believes it is contra-indicated when initial shock is present.

RUSSELL called attention to the cranial nerve paralysis which may occasionally follow spinal anaesthesia.

WADE stated that he now uses nembutol combined with stovaine intraspinally and has found it satisfactory.

JOHNSTONE said that he had never been enthusiastic regarding spinal anaesthesia, but had recently employed it successfully in 21 operations.

MIDDLETON reported that he favored spinal anaesthesia for cases of intussusception in children.

GEORGE R. MCAULIFF, M.D.

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Bagliani, M.: The Roentgenological Diagnosis of Carcinomatous Metastases of the Lungs (Diagnosi radiologica delle metastasi carcinomatose del polmone). *Radiol. med.*, 1931, xviii, 214.

The author made a roentgen study of eighteen cases of carcinomatous metastases in the lungs. He observed that nodular metastases were more frequent than metastases of the infiltrative type. The nodular forms later became infiltrative, but the primarily infiltrative forms remained unchanged and were never associated with discrete localized nodules. Infiltrative lesions progressed more rapidly than nodular and were often associated with pleurisy.

Both types of metastases were most common in the bases of the lung fields; areas above the hilus were rarely involved.

Under roentgen therapy with massive doses the metastases decreased in size more slowly than similarly treated sarcomatous metastases.

PETER A. ROST, M.D.

RADIUM

Mottram, J. C.: Experiments on the Susceptibility of Tumors and Tumor Cells to Irradiation. *Acta radiol.*, 1931, xii, 1.

In the studies reported by the author, tumor cells of rapidly and slowly growing sarcomata and carcinomata showed no decided differences in susceptibility to beta or gamma irradiation from radium, and the skin of the embryo rat showed approximately the same susceptibility to gamma irradiation. The author concludes that the wide differences in susceptibility found experimentally when tumors are irradiated *in vivo* must be due to the effect of the irradiation on the living tissues outside the cells. From previous findings he concluded that the action on the vascular supply is an important factor in the differences found when irradiation is applied *in vivo*.

Spear, F. G.: Immediate and Delayed Effects of Radium (Gamma Rays) on Tissue Cultures *in Vitro*. *Brit. J. Radiol.*, 1931, iv, 146.

The author reports the findings of a microscopic study of tissue cultures subjected to radium irradiation in a hanging drop. He describes in detail the methods by which the cultures were obtained, the technique of Carrel by which they were maintained in the hanging drop so that the radium could be applied while they were under microscopic observation, the technique by which they were grown and subdivided, and the manner in which the number of cells in mitosis per culture was recorded. The quantitative effect of external influences was determined most conveniently from the number of mitotic

cells in the cultures, but it was necessary to make the observations between the twentieth and fortieth hour after subcultivation.

The findings are not considered completely applicable to cells *in vivo*, but are believed to be indicative of fundamental principles of great importance.

The materials and methods used are described and illustrated. The principal procedure was the application of radium to the cultures in an apparatus of special design. The screen employed was 0.5 mm. of platinum. Control cultures were always maintained. In one series of experiments the cultures were exposed to 100 mgm., and in another to 300 mgm. of radium for lengths of time varying from one and one-half minutes to seven and one-half hours. The percentage variation in the mitotic cells as compared with the controls was plotted in curves for the various time exposures in each series.

Exposure for two and one-half minutes to 100 mgm. of radium resulted in a decrease in the number of cells in mitosis followed by an increase which almost exactly compensated for the initial decrease. Exposures of one and one-half minutes were below the required threshold of effect. Three hundred milligrams produced a greater effect with the same intensity (900 mgm.-min.) than 100 mgm. used for the same number of milligram-minutes.

To obtain the delayed lethal effect of radium, cultures were exposed for from three to twenty-four hours to 100 mgm. of radium in one series and to 300 mgm. of radium in another series. The results are summarized in tables. To determine the indirect action of radium upon the cells, four cultures were grown in media which had been previously exposed to 300 mgm. of radium. The results were entirely negative. In this experiment again it was found that 1,800 mgm.-hrs. delivered with 300 mgm. of radium for six hours produced a lethal effect six days earlier than 1,800 mgm.-hrs. delivered with 100 mgm. for eighteen hours. When mitosis was no longer observed in cultures upon repeated examinations, the cultures died from ten to fourteen days after the last dividing cell was seen. However, a few cultures which were subcultivated twenty times became as active and healthy as the controls after irradiation considered to be lethal.

The conclusion is drawn that with gamma irradiation the maximum diminution in mitosis occurs about eighty minutes after completion of the irradiation. Gamma irradiation is capable of causing a delayed lethal effect on tissue cultures *in vitro*, the period of survival before death depending upon the dose of irradiation. The greater the quantity of radium used, the more marked are both the temporary effect and the delayed effect on mitosis.

A. JAMES LARKIN, M.D.

MISCELLANEOUS

Pemberton, R.: *The Use of Massage in Internal Medicine*. *J. Am. M. Ass.*, 1937, xcvi, 1777.

While the influence of a single treatment by massage is very slight, the cumulative effect of many treatments is unmistakable. Massage finds its chief indications in the treatment of the results of trauma and various chronic conditions. In arthritis of either the atrophic or hypertrophic type recovery can seldom be expected without it. The chief purposes for which massage is used are: (1) improvement or maintenance of adequate circulation and drainage in the neighborhood of involved joints, (2) improvement or correction of faulty physiological processes in the soft structures, especially the muscles, and (3) compensation for muscular inactivity due to local or systemic disability from arthritis or the rheumatoid syndrome.

The technique advocated for arthritis is stroking and gentle compression. Care must be taken not to add trauma to the disease process present; therefore pinching and squeezing are contra-indicated. The massage should be applied chiefly to the tissues which surround the site of the arthritic involvement. Only very light stroking should be done over the joint.

In the author's opinion, the value of massage in circulatory disturbances has not received proper recognition in America. While massage is not a specific in these conditions, it is a valuable adjunct to rest and digitalis.

In conclusion Pemberton advocates massage in any condition without acute or serious complications which requires a long period of rest in bed. He believes that this procedure will in a measure compensate for the forced inactivity.

GERTRUDE BEARD.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Galvjal, M., and Vasjutockin: The Method of Studying the Acid-Alkali Balance. Also a Description of Its Changes (Zur Methodik des Studiums des Saure-Alkali-Gleichgewichts, zugleich eine Charakteristik seiner Veränderungen). *Vestnik. Chir.*, 1930, lvi/lvii, 167.

The importance of the study of the acid-alkali balance in modern clinical investigation is generally recognized. Maintenance of the normal concentration of the H^+ and OH^- ions appears to be the most important function of the organism for the regulation of its iso-ionism. Many clinical problems are considered from this standpoint, including the questions of diabetic, postoperative, and nephritic acidosis and the acid-alkali balance in gastric ulcer and urinary lithiasis. As a rule, however, this balance is not studied thoroughly enough, the investigation frequently being limited to the hydrogen-ion concentration of the fluids of the organisms, its buffer systems, or certain aspects of the acid-alkali economy such, for example, as disturbances of the supply of ketone bodies, lactic acid, or phosphoric acid.

A more thorough quantitative, causal classification of the acidoses and alkaloses coming to our attention appears to be absolutely necessary. The authors recommend the classification proposed by Blum and Delaville. In this classification, the acidoses are divided into the hyperacid (excess of acids), the hypo-alkaline (lack of bases), and the mixed hyperacid-hypoalkaline forms, and the alkaloses are divided into the hyperalkaline (excess of bases), the hypo-acid (lack of acids), and the mixed hyperalkaline-hypoacid forms. In addition, different types of acidosis are differentiated according to the type of acid that is formed in excess; e.g., keto-acidosis with an excess of acetone bodies, lacto-acidosis with an excess of lactic acid, chloracidosis, and protein acidosis. Bigwood's classification of acidoses and alkaloses according to their origin into those produced by gases (carbon dioxide) and non-gaseous bodies, and according to their severity, into compensated forms (in which the hydrogen-ion concentration of the blood remains normal) and decompensated forms (in which the hydrogen-ion concentration of the blood is altered) is also very important.

Of the 3 main factors regulating the acid-alkali balance—the blood, lungs and kidneys—the authors discuss in this article only the renal factor. With many collaborators they analyzed the urine of 800 patients. Altogether, about 5,000 analyses were made. In every specimen the hydrogen-ion con-

centration, the titratable acidity, the ammonia, the phosphoric acid, the sulphuric acid, the sodium chloride, and the organic acids were measured. The acid index of the urine is expressed as follows:

$$\frac{\text{Titrimetric acid in gm. HCl per 24 hours} \times \text{NH}_4 \text{ in gm per 24 hours}}{\text{pH}} \times 100$$

Numerically, this index varies normally between 10 and 40. Urines with an index over 40 should be considered acidotic, and those with an index below 10 alkalotic. The more acidotic the urine, the greater the index, and vice versa. In normal urine the total amount of acid present, expressed in liters of a decinormal acid, varies between 3.5 and 5.1 liters. When it is more than 5 liters, a hyperacidosis is present, and when it is less than 3.5 liters, a hypo-acidosis is present. When every acid is measured separately, the quantitative relationships of the existing acidosis may also be determined.

Of the 180 acidotic urines studied by the authors, 71 (46 per cent) were hyperacid (total acidity greater than 5 liters of a decinormal acid) and 85 (54 per cent) were hypo-alkaline (total acidity less than 3.5 liters of a decinormal acid). The hyperacid form appears to be typical of diabetes mellitus, and the hypo-alkaline form typical of the acute inflammatory processes. The authors were unable to find any hyperalkaline urine because the conditions with which it is associated, namely, intestinal stases, were not present in their material.

The following conclusions are drawn:

A quantitative study of the acidoses and alkaloses appears to be indispensable to modern clinical investigation. Such a study is best made by estimating the balance of the bases and acids in the blood and urine. It is of great importance for the determination of the origin of diseases and for rational treatment in cases in which alkalosis or acidosis must be combated.

N. PETROV (Z).

Young, M., and Turnbull, H. M.: An Analysis of the Data Collected by the Status Lymphaticus Investigation Committee. *J. Path. & Bacteriol.*, 1931, xxxiv, 213.

The data on which this report is based were collected by the Medical Research Council and the Pathological Society of Great Britain and Ireland. The special objects of the investigation were primarily to determine by a large series of weights and measurements the standard weight of the normal thymus in relation to age and body weight, and to investigate closely the cause of sudden death in cases in which the only apparent abnormality is the presence of a large thymus. The results seem to warrant the following conclusions:

The average weight of the normal thymus from the age of one year upward may be considered definitely

established within narrow limits since, with one or two possible exceptions, they were in close accordance with the figures based on fairly adequate data which have been published in recent years by other observers.

The average relation of the weight of the thymus to the body weight from the age of one year upward also appears to be well established as it was in close agreement with the ratios found in the data of Bratton and Hammar.

The mean absolute weight of the thymus and the mean ratio of the thymic weight to the body weight up to the age of one year sensibly exceeded the corresponding values based on data from the London Hospital which were published by Greenwood and Woods and by Bratton, respectively, but were not numerically adequate to warrant emphasis on the differences observed.

There was no evidence in the relatively few data available that acute diseases of short duration, i.e., under three days, reduce the average weight of the thymus to an appreciable degree.

An abnormally large thymus in itself cannot be considered indicative of status thymicolymphaticus when no obvious cause of death is found at autopsy. In the series of normal cases under investigation a thymus which could be considered abnormally large for the age was found in twenty subjects, ten of whom were under, and ten of whom were over, sixteen years of age, but in only four cases, in which the death was attributed to anaesthesia or shock, could any special liability to death be assumed to have existed or could the cause of death be regarded as inadequately explained.

It is impossible to judge the importance of anaesthetics or shock as causes of death because their effects cannot be measured in the dead body. The cases in which death was attributed to anaesthetics or shock are therefore most important. Among the cases studied there were twenty-three of this type. Of the four in which the thymus could be considered abnormally large for the age, a major operation had been performed in one and purulent bronchitis, dilatation of the right ventricle, and hypertrophy of the left ventricle were found at autopsy in another. In two, the conditions were similar to those in other cases in which the thymus was not unusually large.

Though there has been some divergence of opinion in the interpretation of the term "encirclement of the trachea" by the thymus, this condition appears to be comparatively rare and is not necessarily associated with a thymus exceeding the average weight.

In the cases of normal subjects up to the age of sixteen years there appeared to be little if any association between the weight of the thymus and the amount of lymphoid tissue in the various parts of the body insofar as this amount could be determined by volumetric measurements of the faucial and lingual tonsils, selected lymph glands from certain sites, and Peyer's patches.

The relatively few data available showed no definite evidence of a concomitant general hyperplasia

of the lymphoid structures in the cases of abnormally large thymus.

The amounts of lymphoid tissue in the several parts of the body, insofar as they may be represented by the selected criteria, seemed to show practically no association with one another to which any significance can be attached.

In the series of subjects with Graves' disease there was evidence that the average gross weight of the thymus was distinctly above the normal. This observation confirms the more or less generally accepted theory based on naked-eye observation that the thymus is almost always abnormally large in Graves' disease. Though the relatively few data available do not warrant definite conclusions, they suggest strongly that the percentage proportion of glandular tissue in the thymus is above the normal, but that there is no definite general hyperplasia of lymphoid structures in this affection.

In the cases studied there was no evidence of an association between arterial hypoplasia and an abnormally large thymus.

The relatively few data with regard to feminism in males as indicated by a female type of distribution of the pubic hair did not suggest that the weight of the thymus is abnormal when this feature is present.

In the opinion of the Committee the facts elicited in this inquiry agree with those reported by Hammar in 1926 and 1927 and those reported by Greenwood and Woods in 1927 in affording no evidence that so-called status thymicolymphaticus is a pathological entity.

JACOB M. MORA, M.D.

Toomey, J. A., and Freedlander, S. O.: Further Experiences with Non-Specific Local Cutaneous Immunity to *Staphylococcus Aureus*. Local Non-Specific Protection. *J. Exper. M.*, 1931, liii, 363.

In a previous article, Toomey and Freedlander reported experiments on guinea pigs in which they found that plain broth compresses exerted a protective influence against lethal subcutaneous injections of *staphylococcus aureus*. In this article they report experiments in which they noted that plain water, dry compresses, and saline compresses were only slightly protective. Normal horse serum and Liebig's meat extract protected with about the same efficiency as broth compresses, but mustard plasters and peptone were less protective. The authors believe that specific filtrates (Besredka) are no more effective than broth, and that the local protection in their experiments was of a non-specific nature.

M. HERBERT BARKER, M.D.

Dameshek, W., and Ingall, M.: Agranulocytosis (Malignant Neutropenia). A Report of Nine Cases, Two with Recovery. *Am. J. M. Sc.*, 1931, clxxxi, 502.

As in many cases of agranulocytosis there is no angina, the authors advocate the adoption of Schilling's term "malignant neutropenia" to designate the condition in place of the term "angina agran-

ulocytica." Of the nine cases they report, only four presented the syndrome described by Schultz.

In the typical case of agranulocytosis the diagnosis is relatively easy as the syndrome is now fairly well known. The condition should be suspected when a middle-aged person develops sore throat accompanied by chills, a high fever, and ulceration followed by membrane formation. In such a case it should be suspected especially if the fever and toxic symptoms are out of all proportion to the amount of ulceration and membrane formation. Acute follicular tonsillitis, streptococcal sore throat, Vincent's angina, and diphtheria must be ruled out. Except in rare cases of streptococcus hamolyticus septicæmia with sore throat, in which there are at least 85 per cent of polymorphonuclears, none of these conditions causes a leucopenia.

The diagnosis would be made more frequently if a white blood-cell count were carried out more routinely in suspected cases. The chief laboratory finding is the marked leucopenia, which is due to the disappearance of granulocytes (polymorphonuclear cells). At first, the lymphocytes may be present in their normal absolute numbers, but as the disease progresses they become greatly reduced as the result of a marked depression in the lymphoid and reticulo-endothelial tissue as well as in the granulocytic tissue. In mild cases, the count may gradually fall to 1,000 per cubic millimeter.

As a rule, the red cell count is only slightly affected, but if the illness lasts more than the usual ten days it may fall to fairly low limits. In one of the cases reported it fell to 1.5 million. The color index is less than 1, and of the secondary anemia type. The blood platelets are reduced only when the disease is of long duration.

In one of the cases reported by the authors, biopsy of the bone marrow of the sternum was normal. In another, the smear showed complete absence of both myelocytes and polymorphonuclear cells but numerous erythroblastic cells. The marrow is usually red and normal in erythrocyte and platelet-forming elements, but deficient in granulocytes.

In a case without angina but with fever of more or less long duration, the diagnosis is more difficult, but can be made by frequent white blood-cell and differential counts. In typhoid and influenza, the white cells rarely fall below 4,000 and the polymorphonuclears seldom fall below 25 per cent. Generalized tuberculosis, pneumonia, streptococcal septicæmia, and lymphoblastoma must be ruled out. In acute leucopenic lymphatic leukæmia the bone marrow is crowded with lymphoid cells. In aplastic anemia, the marrow is yellow, completely aplastic, and barren of red cells, white cells, and megakaryocytes. The blood picture is therefore characterized by a rapidly advancing anemia of the hyperchromic type and a marked reduction in the platelets resulting in more or less marked hemorrhage. In agranulocytosis, bleeding is rare.

Ninety per cent of cases of malignant neutropenia have proved fatal. Recovery is believed to be

spontaneous, and can be expected only in mild cases.

Rational methods of therapy include repeated transfusions to add polymorphonuclear cells to the blood, and foreign protein therapy to stimulate the reticulo-endothelial system. It is possible that roentgen irradiation over the long bones may stimulate a yellow inactive marrow to become red and active.

The authors believe that malignant neutropenia is primarily the result of an abnormal reaction of the bone marrow to severe sepsis.

MAURICE MEYERS, M.D.

Harkins, H. N.: Granulocytopenia and Agranulocytic Angina with Recovery: Report of Eight Cases with Four Recoveries. *Arch. Int. Med.*, 1931, xlvii, 408.

In 4 of the 8 cases reported by Harkins, the condition appeared to be a true agranulocytic angina. Three of the 4 recoveries occurred in this group. The onset of agranulocytic angina is sometimes preceded by a mild granulocytopenia. In 4 previously reported cases of the disease death occurred from a second attack. The author suggests that the condition may be due to a constitutional defect in the bone marrow. In 2 of the cases in which recovery resulted, liver extract was used. In the 150 cases of agranulocytic angina which have been reported to date, the mortality was 82 per cent.

JACOB M. MORA, M.D.

Lumsden, T.: Tumor Immunity. *Am. J. Cancer*, 1931, xv, 563.

This is a comprehensive report of the author's long and extensive studies of tumor immunity carried on at the London Hospital. Lumsden describes his method of tissue culture by which he has shown that animals are capable of forming antibodies which have a specifically lethal effect upon malignant tumor cells of any variety, but are non-toxic to normal cells.

The response of any animal to the implantation of tumor cells consists in the interaction of two important mechanisms: (1) the defensive forces of the animal, which include a pre-existing general force (heterotoxins) and a specially trained reserve force (antibodies and leucocytes), and (2) the defensive force of the invading cells. Any fixed tissue cell which grows in any animal becomes protected more or less completely against all antibodies formed by that animal or by any animal of the same species.

Investigating the effects of injecting antisera into tumors, Lumsden was able to cure Jensen rat sarcoma when the tumor was grafted into the foot, the circulation of the foot was shut off by constriction for several hours, and the antiserum was injected during the time the circulation was cut off. The cure produced an active immunity against inoculations of the tumor in all parts of the animal's body. Lumsden concludes that when gradual regression of a foot tumor is caused by the injection

of antiserum into the neoplasm with simultaneous constriction, the absorption of antigenic material from the dying tumor induces active immunity against the tumor in the same way as a vaccine.

Attempts to produce such an active immunity by the injection of attenuated tumor cells were not satisfactory. Drying, freezing, centrifugalizing, and alcohol or ether extraction produced either too little attenuation or carried the attenuation far enough to destroy the vitality of the tumor cells. Even when the animals were repeatedly vaccinated with material becoming progressively less attenuated, it was impossible to produce a satisfactory immunity.

However, Lumsden succeeded in producing an effective autovaccine in the living animal by repeatedly injecting formalin into the growing tumor. Animals cured by such autovaccination exhibited an immunity against subsequent test implants. Cure by autovaccine treatment of a large Jensen rat sarcoma or R. IX tumor of one flank was followed by regression of a small untreated tumor of the other flank. Excision or gross destruction by strong chemical reagents had no such effect. Incomplete excision of an untreated virulent tumor was invariably followed by recurrence even if only a few cells were left behind, whereas, after formalin treatment, regression continued and went on to cure when a very large number of living cells or even some dividing cells were left after partial excision. In the case of certain tumors, e.g., M 63 and Twort's mouse carcinoma, no effective degree of protection remained after excision, yet vaccine treatment, when successful, rendered the mouse immune.

The autovaccine treatment was applied to spontaneous tumors arising in mice from the inbred strain of tumor-bearing mice bred by Simpson at Buffalo. In three mice, cure of the original tumor was followed by regression of the test implantation.

C. D. HAAGENSEN, M.D.

Bonnet, L., and Bulliard, H.: Cancerization of Polyps (La cancérisation des polypes). *Ann. d'anat. path.*, 1930, vii, 1039.

The question is raised whether a polyp becomes cancerous because it contained latent malignant cells in its earliest stages or because a metaplasia of benign cells occurred. To throw light on this problem the authors review the literature on polyps of the bladder and uterus and report, with photomicrographs, three nasal and one uterine polyp.

Bladder polyps have been well studied. Zuckerkandl, Lubarsch, and Steinhaus claim that if a polyp becomes malignant, careful examination of it in its earliest stages would have revealed atypical cells. On the other hand, Guyon, Legueu, and Marion maintain that cancer develops in benign bladder polyps.

Nasal polyps are classed as soft and hard. The soft polyps are common, inflammatory, and benign. The hard polyps are relatively rare; Eckert-Moebius was able to collect only sixty cases from the literature. The hard polyps are histologically benign, but

present a striking tendency toward quick recurrence after excision and toward metaplasia of their cylindrical cells to squamous cells or even epithelial pearls.

The first nasal polyp described by the authors was of the soft type. At the periphery its structure was masked by inflammation, but at the base it was branching, typically papillomatous, and benign.

The author's second nasal polyp showed a benign papillary structure as a whole, but its fibrous axes were thin and its epithelium presented many layers. The surface cells were squamous and in places were cornified. Deeper cells represented transitions between squamous and ciliated cylindrical nasal cells. The end of one bud showed desquamation, below which the epithelial cells were irregular in size. Some of the epithelial cells contained multiple nuclei, some contained nuclei of different shapes, and some were nucleated like giant cells. Mitoses, though rare elsewhere, were moderately numerous. The lesion was precancerous.

The third specimen of nasal polyp was similar to the second. Cords and deep bays of cells invaded the tissue. The epithelial cells were large and showed large acidophilic nuclei. The stroma was filled with plasmocytes and Russell bodies, and mitoses were numerous.

The authors' specimen of uterine polyp showed signs of malignancy. Carcinoma in uterine polyps is rare and difficult to trace because of the variety of structures. Lahm reported a cervical erosion and regeneration showing both cylindrical cervical epithelium and squamous vaginal epithelium, but no definite area of malignancy. The authors cite three cases of malignancy in uterine polyps which have been reported in the literature. Their own specimen was an example of mucous polyp. The neoplasm was bordered by inflamed connective tissue and plaques of epithelium. The stroma was infiltrated with round cells and was oedematous and very vascular. There was marked proliferation of the covering epithelium about a gland the lumen of which was still apparent, but the mucous cells of which were limited to the region near the lumen or were absent altogether. Within this epithelial invasion there were pearl-like structures and numerous mitoses. The epithelium was largely squamous.

The authors believe that malignant degeneration of polyps is due to metaplasia of the cells rather than to the presence of malignant cells within neoplasms in their early stages. They state that malignancy in polyps is not exceptional, but bladder polyps, which often become malignant, are in a class by themselves.

CURTIS NELSON, M.D.

Sugiura, K.: A Further Study on the Influence of an Aqueous Extract of Suprarenal Cortex on the Growth of Carcinoma, Sarcoma, and Melanoma in Animals. *Am. J. Cancer*, 1931, xv, 707.

This is an exhaustive study of the effect of an aqueous extract of sheep suprarenal cortex, prepared according to the method of Coffey and Humber on different types of tumors in various animals.

Repeated subcutaneous or intramuscular injections of the extract were given. The Flexner-Jobling rat carcinoma, the Sugita rat sarcoma, the Bashford mouse carcinoma No. 63, transplantable mouse melanoma, Rous chicken sarcoma, and a series of fourteen spontaneous mammary mouse carcinomata were studied.

No curative, retarding, or accelerating influence upon the tumor growth was noted. The extract did not produce early tumor ulceration nor did it prolong the life of the tumor-bearing animals.

C. D. HAAGENSEN, M.D.

GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Suermondt, W. F., Inoculation Tuberculosis (Impftuberkulose). *Zentralbl. f. Chir.* 1930, p. 2391.

Traumatic tuberculosis has been attributed to three types of injury: (1) infecting trauma causing inoculation tuberculosis, (2) localizing trauma producing an area of lowered resistance to bacteria circulating in the blood stream at the time of the injury, and (3) mobilizing trauma, i.e., trauma lighting up or aggravating a previously existing tuberculous focus.

Various objections have been raised against this conception. Zollinger and Magnus, among many others, agree that inoculation and mobilizing trauma are definite factors in the occurrence of traumatic tuberculosis, but reject the theory of a localizing trauma. Clinical experience speaks against localizing trauma since operative wounds such as those produced by amputation, which constitute large areas of diminished resistance, never become tuberculous. Tuberculous infection of the wound can occur only when a tuberculous focus is opened during the operation. Also disproving the concept of localizing trauma are the investigations of Roeple and others which indicate that virulent tubercle bacilli are found in the blood only in generalized milary tuberculosis, far-advanced pulmonary tuberculosis, and sometimes just before death from tuberculosis.

The findings of experiments on animals are not directly applicable to man as animals are in general much more sensitive to tuberculous infection than human beings. According to Zollinger, it is permissible to speak of injury as a localizing trauma only when it so diminished the general resistance of the organism that bacilli which entered the body at the time of the trauma or before cessation of its after-effects entered the traumatized tissue and caused an infection of the organism from that site. In the majority of cases a latent focus is present before the trauma and the trauma is to be considered as having a mobilizing effect. According to Magnus, the trauma must be quite severe. A relationship of tuberculosis to trauma is too frequently assumed. This error may be readily avoided by making a roentgen examination immediately after the injury.

The only pure form of traumatic tuberculosis is inoculation tuberculosis. According to Flesch-Thebesius, the latter is also the only form of surgical tuberculosis. Schmidt believes this theory must be modified as, in his opinion, a secondary factor, a predisposition to tuberculosis, must be present in addition to inoculation. True inoculation tuberculosis occurs in wounds which bleed very little (bleeding wounds clean themselves) and usually in more or less lacerated wounds. It practically never occurs in large wounds because in the latter there is usually a marked wound reaction. The classical form of inoculation tuberculosis is that occurring after circumcision of Jewish children as the result of sucking of the wound by an infected operator. The first signs of inoculation tuberculosis are noted two weeks after the infection. Wolff reported that in fifty-six cases the mortality was 63 per cent. Next in frequency is inoculation tuberculosis occurring in physicians from infection at autopsy. In such cases the condition usually develops within three or four weeks—at the latest, after six months. In the spread of the process through the lymphatics, swellings of the regional lymph glands appear.

The author reports two cases of true inoculation tuberculosis. The first was that of a ten-year-old boy who ran barefoot in the street in front of a neighbor's house where a tuberculous patient expectorated into the street. The boy stepped on a nail. After several weeks, typical tuberculosis developed in the nail wound and several softened and perforating lymphomata appeared in the groin. Roentgen examination demonstrated no tuberculosis in the bones of the feet.

The second case was that of a thirteen-year-old boy in the same village who was bathing in a ditch behind the houses and wounded the back of his foot with a glass splinter. After three weeks a tuberculous ulcer developed at the site of the injury and glandular swelling appeared in the groin. The treatment consisted of extirpation of the tuberculous focus and irradiation of the glands.

In the first case, which was treated conservatively, healing required about a year, whereas in the second case it required only six months. In both cases the diagnosis was verified by histological study.

In the discussion of this report, HABERLUND stated that the presence of tubercle bacilli in the circulating blood of apparently healthy persons was reported as early as twenty years ago.

VON REPWITZ said that the question of traumatic tuberculosis should be decided from clinical findings rather than from insurance company conclusions.

ROEPKE cited the case of a healthy country girl who fell on a fence in such a way that the point of a picket entered the parametrium alongside of the vagina. Failure of the wound to heal was found to be due to an active tuberculous process.

LANZ cited the case of a fifteen-year-old boy who developed tuberculosis of the elbow joint and after each of about six injuries occurring in a period of

twenty-five years there after developed tuberculosis at the site of the trauma.

COENEN emphasized that it is necessary to be very strict in our conception of traumatic tuberculosis as patients usually have a tendency to associate their condition with trauma.

ZOLLINGER stated that the incidence of traumatic tuberculosis of bone is 1.5 per cent. KOTT (2).

Lowenstein, P. S.: *Staphylococcus Septicæmia*. *Am. J. M. Sc.*, 1931, clxxvi, 195.

As staphylococci are constantly present in the skin, it has been generally believed that staphylococcal septicæmia is a relatively benign condition. However, the records of the Jewish Hospital of St. Louis show that of eighteen cases seen in the last five years, fourteen were fatal.

Although a bacteræmia frequently exists without signs of infection, the term "septicæmia" is usually employed to designate the presence of bacteria in the blood in association with fever, petechial hæmorrhages, or other clinical manifestations.

The portal of entry for the staphylococcus is usually a skin lesion and less often an infection of the mucous membrane of the gastro-intestinal, respiratory, or genito-urinary tract. Martin states that, in young persons, masses of bacteria often lodge in the large venous capillaries of the long bones and are either taken up by the capillary endothelium or cause osteomyelitis. Such bone lesions may serve as foci of infection from which bacterial emboli are freed into the circulating blood during exacerbations or may remain dormant, to be lighted up by a slight injury. Bacteria may be present in the blood stream only at intervals, the blood acting merely as a means of transporting them.

The outcome of an infection is determined by the invasive power of the organism and the resistance of the host. When an organism which is usually only slightly virulent produces a septicæmia, the resistance is greatly lowered and the prognosis is more serious than in cases of septicæmia due to an organism gaining entrance by its own virulence. In fifty-seven recently reported cases of septicæmia, the mortality according to the infecting organism was as follows: staphylococcus aureus, 57.9 per cent; staphylococcus albus, 62.5 per cent; and staphylococcus of unstated type, 72.7 per cent. The total mortality was 61.4 per cent. These percentages confirm Stetson's statement that the staphylococcus is the deadliest organism in general sepsis. Staphylococcal septicæmia secondary to furuncles is almost invariably fatal.

The methods of treatment fall into three groups: (1) supportive measures, such as blood transfusion, glucose and saline solution infusions, and irradiation with ultraviolet light; (2) surgical measures for draining or removing the primary and secondary infections; and (3) the administration of substances such as dyes, immunized blood, vaccines, bacteriophage, antitoxin, and non-specific protein to combat the infecting organism directly in the blood stream.

Early transfusions, frequently repeated, are necessary to overcome the extreme toxæmia and prostration. Complete physiological rest is imperative. Irradiation with ultraviolet light may be beneficial. Infusions of glucose and saline solution are valuable supportive measures.

Surgical or other treatment of the focus of infection is necessary to prevent continued flooding of the blood stream with bacteria, and should be given with minimal trauma.

The beneficial effects sometimes noted after intravenous injections of chemicals may be due to the bactericidal or bacteriostatic action of the chemical or its toxic effect on the body cells, particularly the cells of the reticulo-endothelial system. Although Young reported remarkable improvement following the injection of mercurochrome, the consensus of opinion favors the use of gentian violet in combating gram-positive staphylococci. In general, reports vary so widely that the value of intravenous injections of dye is still questionable.

Because of the time required to immunize the donor, blood transfusions from immunized donors promise more for chronic cases than for acute cases.

Lowenstein believes that when the condition is acute vaccines are of questionable value as the body is already subject to an almost overwhelming bacterial invasion, but that in chronic cases they may be of aid in building up resistance.

The recent discovery of the production of an exotoxin by certain strains of staphylococci has resulted in the preparation of a protective anti-serum from animals immunized against those strains. However, of three cases in which the author used this antitoxin, it gave an apparently good result in only one and failed to cause improvement in two.

The use of bacteriophage is still in the experimental stage.

In two cases in which Lowenstein employed non-specific protein therapy, no improvement was noted. Lowenstein believes that this treatment is indicated only in chronic cases, if at all, and in the latter is of less value than autogenous vaccines.

As no method yet developed gives satisfactory results, prophylaxis remains the most hopeful method of lowering the mortality. Squeezing and pricking furuncles, plucking hairs from infected follicles, and other measures in common use by both laymen and physicians are to be condemned. Conservative treatment is indicated until a defensive wall has formed about the infection. Sterilization of milk and early treatment of infected tonsils and nasal sinuses should reduce the death rate from staphylococcal infections of the gastro-intestinal and respiratory tracts.

Blood cultures should be taken early and repeated until they become positive. After they have become positive, vaccination of a suitable donor should be begun immediately in order that immunized blood for transfusion may be available as soon as possible. Meanwhile, transfusions of whole blood should be

given early and frequently, together with infusions of glucose and saline solution as often as indicated. Lowenstein advises, in addition, the administration of large amounts of staphylococcus antitoxin intravenously, intramuscularly, and, if necessary, intraspinaly.

E. S. PLATT, M.D.

SURGICAL PATHOLOGY AND DIAGNOSIS

Conner, H. M.: *Blood Pathology In Relation to Surgery. J. Lab. & Clin. Med., 1931, xvi, 647.*

The author discusses: (1) diseases of the blood and hematopoietic organs in which operation is indicated or must be considered; (2) surgical diseases of other types, in which a study of the blood may be of value in the diagnosis, prognosis, or treatment; (3) hemorrhagic diseases as possible contraindications to operation; and (4) postoperative complications in surgical cases in which studies of the blood are of value.

The spleen and lymph nodes are commonly regarded as belonging to the hematopoietic system. In any case in which there is considerable enlargement of the spleen or lymph nodes, the possibility of a surgical condition must be considered.

The three most common conditions of the spleen in which operative procedures are indicated are congenital and acquired hemolytic icterus, purpura hemorrhagica, and splenic anemia. Less common conditions for which operation is usually necessary are tumors and cysts and syphilis which has not responded well to anti-syphilitic treatment. Other splenic conditions for which surgery is sometimes considered are tuberculosis, Gaucher's disease, splenomegaly accompanying certain types of cirrhosis of the liver, myelogenous leukemia, von Jaksch's disease, and infectious splenomegaly of indeterminate type accompanied by focal infection. Splenectomy is seldom done in cases of malarial spleen if the correct diagnosis is made or in splenomegalic polycythemia.

In surgical diseases of other types, the leucocyte count is probably of prime importance. It is of aid chiefly in the diagnosis of infection. On the whole, the number of leucocytes is greater in the presence of purulent infections than in the presence of non-purulent infections and in the presence of free abscesses than in the presence of walled-off abscesses.

The differential leucocyte count is also of value. Serious infection may be indicated by the normal values for the total number of leucocytes accompanied by large increases in the percentage of neutrophils.

Eosinophilia may be of aid in the diagnosis of parasitic infections such as echinococcus disease, trichinosis, amebic dysentery or abscess, and abdominal pain of allergic origin.

Leucopenia may assist in distinguishing typhoid or paratyphoid fever from other causes of abdominal pain, and malaria from septic causes of chills and fever.

Estimation of the concentration of hemoglobin and of the number of erythrocytes is of value in surgery mainly in the recognition of the forms of secondary anemia caused by surgical diseases such as carcinoma of the esophagus, stomach, and intestines, in which the anemia may be the result of hemorrhage or a part of the cachexia. The possibility of another cause, such as infection and dietary deficiency, must also be kept in mind.

In any case in which a surgical procedure is contemplated, it is necessary to make sure that hemorrhagic diathesis is absent. The principal conditions associated with a hemorrhagic tendency are hemophilia, the several forms of purpura, and the hemorrhagic tendency which appears in obstructive jaundice. Attention is called to certain cases in which the type of hemorrhagic disease present cannot be diagnosed definitely. In any case of hemorrhagic disease, operation should be attempted with the greatest caution, if at all. If transfusions are given they should be sufficiently large to keep the coagulation time of the blood low during the operation and the healing process.

In postoperative complications, the leucocyte count is the most valuable of all laboratory procedures. In postoperative shock the reduced blood volume may be of aid in the diagnosis. A reduction in the number of erythrocytes and the concentration of hemoglobin may be due to anemia resulting from operative or postoperative hemorrhage or infection, a preexisting anemia, or an independent anemia, such as pernicious anemia, developing after the operation.

McDonald, E., and Hueper, W. C.: *Cancer and the Laboratory. J. Lab. & Clin. Med., 1931, xvi, 713.*

Of thirty-five laboratory diagnostic tests for cancer which were studied by the authors, none proved of sufficient interest to warrant its further investigation.

The authors state that in every case of cancer a blood count should be made before treatment, especially before irradiation, is undertaken. When leucopenia or lymphopenia is present great care is necessary. A leucocyte count should be made before every radium irradiation. In untreated cancer, the hydrogen-ion concentration of the blood plasma is more alkaline than normal. The greater the alkalinity the worse the prognosis. A very alkaline hydrogen-ion concentration (pH 7.45 to 7.60) is an unfavorable sign, especially after irradiation. It should be improved before further irradiation is given. Lessened glucose tolerance is characteristic of cancer. When the blood sugar is high before the second irradiation, care is necessary.

Biopsy tissue must be removed from suspicious parts of a lesion. Infiltrating growths present greater difficulties in the selection of the place for biopsy than ulcerating growths. The tissue removed must include the peripheral portions of the tumor, the actively growing sections, and must be wedge-shaped so that it will include also the deeper in-

filtrative growth. It must be sufficient for adequate histological study, and should be fixed immediately.

With regard to the classification of blastomata, the authors state that a regional classification is necessary, but adds little information. Physical classification of the tumors into those of the solitary, multiple, ulcerative and indurative types increases the accuracy of the description, but is of little value without a histological classification. For a sound etiological classification our present knowledge is too defective. Of the histological classifications, a histogenetic grouping is open to the objection that the neoplasm may present a morphological resemblance to different types of tumor tissue and, as in the case of an adamantinoma changing to a cylindrical-cell carcinoma, may pass through various structural phases that obscure its histogenesis.

For a classification based on the origin of tumors from ectoderm, endoderm, and mesoderm, our knowledge is still defective, but a morphological classification based on a comparison of the tumor structure to existing embryonic and adult tissues is practical as the great majority of blastomata can be classified on this basis without great difficulty. A classification based on the proportion of stroma to parenchyma is not reliable as the cellularity of the characteristic parts of a neoplasm may be disguised by necrosis, œdema, or scar formation.

The authors present their own classification which is based chiefly on morphological characteristics.

The terms "carcinoma" and "sarcoma" designate such widely varying degrees of malignancy that a classification based on varying biological differences has been developed. The tumors are grouped according to their potential histological malignancy

as indicated by their cellular and structural characteristics. Broders and others have grouped neoplasms according to cellular differentiation. The authors' histological malignancy index has twenty factors based on the structural characteristics of the cancer and the characteristics of the cytoplasm, nuclei, and stroma.

The grading of tumors is still a subject of controversy. In the choice of treatment the grade of histological malignancy is not the only factor to be considered. The patient's age, heredity, and general condition, and the location and growth qualities of tumor are equally important.

Bergonie's law that radiosensitivity increases with the degree of immaturity of the tumor has not been corroborated for the breast and the uterine cervix by Hueper and Schmitz. In highly immature neoplasms the primary effect of irradiation is more marked, but the permanent curative effects are worse than in more mature types.

The following example of a proper pathological diagnosis is given:

"Ulcerated papillary adenocarcinoma of the uterine cervix. Malignancy, Grade 3; radiosensitivity, Grade 2."

The authors emphasize that it is important for the pathologist to co-operate closely with the clinician and to know the clinical characteristics of borderline lesions.

So-called pencil-cells—slender or oval cells with elongated hyperchromatic nuclei which as a rule are arranged radially about the periphery of malignant masses—represent apparently a defensive reaction of the epithelium against cancer cell development and growth.

HARRY C. SALTZSTEIN, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

SURGERY OF THE HEAD AND NECK

Head

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INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Castronovo, E.: Hereditary Familial Craniostenosis (Sulla craniostenosi familiare ereditaria). *Radiol. med.*, 1931, xviii, 325.

Castronovo reports five cases of hereditary familial craniostenosis which occurred in one family, and a case of sporadic-oxyccephalic craniostenosis.

The mother of the family, a woman forty years of age, was the youngest of three children. Her parents and grandparents were apparently normal and lived to an old age. She had a normal brother and sister, both of whom had normal children. Ever since birth she had had a characteristic facial deformity, consisting of a moderate exophthalmos with an increase in the interocular distance and a pronounced projection of the lower jaw. Her early history was essentially negative except for attacks of severe cephalalgia until the age of twenty years.

She married when she was twenty years of age. Her husband was apparently normal. Her first two children showed no defects, but the following four children had the characteristic facial deformity present in the mother and, in addition, disturbances of vision. These children, two boys aged twelve and eight years and two girls aged ten and six years, had varying degrees of exophthalmos, a small hook-shaped nose, and a projecting lower jaw. Three of the children had convulsions during infancy and all of them suffered from attacks of severe cephalalgia. The boy eight years of age was blind and two of the other children had amblyopia. One child had apparently normal vision. The acuity of vision seemed to diminish with the increase in the degree of exophthalmos. The two boys had a rotary nystagmus. All had a divergent squint, which the author believes was due to the marked exophthalmos rather than to a paralytic squint. All had an increase in interocular distance.

Ophthalmoscopic examination of these patients showed different fundus findings. The mother had a normal fundus, but the children showed evidence of

venous stasis, optic neuritis, optic atrophy, or concentric narrowing of the visual fields.

The blood Wassermann test was negative. Examination of the spinal fluid, performed only in the case of the boy aged eight years, disclosed slightly increased pressure and slight reduction of Fehling's solution. The albumin, Pandey, Nonne-Aspelt, and Wassermann tests on the spinal fluid were negative. There were 3 lymphocytes per cubic centimeter.

Röntgen examination of the skulls showed them to be small and of a marked bradycephalic type. The maximum anteroposterior diameter varied from 170 to 175 mm. The bony walls were very thin, especially in the frontal area. There was no evidence of dioplö. The inner surface of the skull presented deep impressions. There were no sutures.

The paranasal sinuses were poorly developed or absent. The frontal sinuses were absent. The maxillary and ethmoid sinuses were absent or poorly developed. The sphenoid sinuses were present, but were small. The mastoid cells were absent.

Most of the sulci of the lateral sinuses were broad and deep. The arterial sulci were distinct in some cases, but in others were absent.

The pineal body in the mother was calcified but in the normal position. The face was disproportionately small in relation to the skull because of the lack of development of the maxillæ. The mandible and the dentition were normal.

The size of the orbital fossa measured from the tuberculum sellæ to the glabella, which in normal persons averages about 65 mm., was reduced to from 45 to 55 mm.

The sella turcica, which was of the same size and contour in all of the subjects, did not present the characteristic deformity which occurs secondarily to increased intracranial pressure. It was large and resembled the sella seen in persons with acromegaly. However, there were no trophic disturbances or malformations that could be attributed to hypophyseal dysfunction.

The case of sporadic oxycephalic craniostenosis reported by the author was that of a young man who was the only member of his family with the deformity. He presented all of the facial characteristics noted in the familial cases, but had no disturbance of vision. The essential difference from the familial type was oxycephaly with hyperostoses of the vertex, an elliptical head with a long anteroposterior diameter, normally developed sinuses, and more pronounced depth of the posterior fossa.

The author reviews the literature, calls attention to the various classifications of craniostenosis, and discusses the pathogenesis and course of the disturbance.

PETER A. ROST, M.D.

EYE

Finnoff, W. C., and Thygeson, P.: Bacterium Granulosis in Trachoma. *Arch. Ophthalm.*, 1931, v, 527.

The authors' results and conclusions in a bacteriological study of trachoma are summarized as follows:

1. A minute Gram-negative motile rod apparently identical with that described by Noguchi under the name "bacterium granulosis" was recovered from five of thirteen white persons, one Japanese with advanced trachoma, and two of fourteen trachomatous Indian children.

2. The bacterium is either rare or absent in non-trachomatous diseases of the conjunctiva.

3. Bacterium granulosis may be considered more characteristic of trachoma than the inclusion bodies of Prowazek or the initial bodies of Lindner, since it can be recovered from patients with advanced disease at a time when the inclusion bodies and initial bodies are usually absent.

4. The probable reason for the failure of former investigators to discover the organism was the use of unsuitable media and failure to cultivate at the optimal temperature of 30 degrees C.

5. The bacterium was not agglutinated by serum from cases of trachoma.

6. Skin tests with bacterium granulosis antigen were negative with one exception.

7. Bacteria morphologically identical with bacterium granulosis were seen on and in the epithelial cells in smears taken from trachomatous patients and from animals having the experimental disease.

8. Inoculation of macacus rhesus monkeys with suspensions of bacterium granulosis resulted in the production of a granular conjunctivitis identical with that described by Noguchi and also with that resulting from the injection of human trachomatous material.

9. Contact infection occurred in one of two monkeys exposed.

10. The bacterium was successfully recovered from two animals having an advanced disease.

11. The results of these studies seem to confirm those of Noguchi in all essential respects.

12. Because of the fact that trachoma in monkeys is not identical with trachoma in human beings, it may be necessary to resort to human inoculations to

prove or disprove conclusively the etiological relationship of bacterium granulosis to trachoma.

LESLIE L. MCCOY, M.D.

Barkan, O., Barkan, H., Randel, H. O., and Smith, H. G.: Squint: Its Physiopathology and Surgical Treatment. *Arch. Ophthalm.*, 1931, v, 691.

The authors believe that squint is based on general nervous instability which may be inherited. They characterize early squint as a habit spasm which becomes more difficult to cure the longer it persists. They operate for squint at any age, as soon as it is evident that other treatment will not avail. They perform O'Connor's cinch operation, which they describe in detail.

The article contains experimental data regarding the O'Connor operation and the reports of several illustrative cases.

SAMUEL A. DERR, M.D.

Key, B. W.: Transplantation of the Human Cornea: Report of a Case. *Arch. Ophthalm.*, 1931, v, 789.

Key reports the transplantation of the cornea of a man thirty-two years old who had a small choroidal sarcoma, to a man twenty-six years old who had an opaque cornea and a symblepharon caused by a steam explosion two years earlier. In each case, the conjunctiva was dissected 4 mm. from the limbus and the cornea incised at the limbus with a keratome, cataract knife, and scissors. The graft was placed with scleral sutures. At the first dressing, five days after the operation, the anterior chamber was re-formed. The graft was a complete take. There has been no disturbing hypertension and no iris prolapse. Nineteen months later, vision was perception of hand movements.

This method presents advantages over corneal grafts made with a trephine.

SAMUEL A. DERR, M.D.

Knapp, A.: Extraction of Cataract: Report of a Third Hundred Successive Extractions in the Capsule After Preliminary Subluxation with the Capsule Forceps. *Arch. Ophthalm.*, 1931, v, 575.

The type of senile cataract suitable for intracapsular extraction after subluxation is that in which the capsule is dense enough to hold the grasp of the forceps. Cataracts in persons under fifty years of age are usually not suitable. When the cortex is glistening the capsule ruptures. A sclerosed lens with a posterior cortical opacity dislocates readily; also a lens with a thickened capsule. The morgagnian cataract is difficult to grasp and its capsule ruptures easily. The section must be large enough, especially in undersized eyes. In the latter the incision should be scleral throughout.

Contra-indications to the operation discussed are prominent eyes, complications due to vitreous disturbances, myopic eyes, soft eyes, cyclitic eyes, nervousness, and restlessness. The most important part of the technique is the use of the capsule forceps. The first and essential step is subluxation of the cataract by the use of Kalt capsule forceps. The

capsule must be grasped in the lower third of the anterior part and then carefully manipulated from side to side, forward and upward, counterpressure being made backward and downward at the lower limbus with a Smith hook. If any complication is feared, the speculum should be replaced by retractors. After subluxation below, the cataract tumbles following pressure straight back at the lower limbus with the Smith hook and counterpressure above against the scleral lip of the incision. If subluxation does not occur readily, care must be taken not to use undue traction. Sometimes complete subluxation is difficult after the patient has moved and partial subluxation has taken place laterally or above. Precautions to prevent prolapse of the vitreous are necessary. The head-on delivery (Stanculeanu-Torok) is objectionable because it is associated with greater traumatism, greater danger of prolapse of the vitreous, and greater likelihood of rupture of the capsule during extraction of the lens.

The author reviews 100 cases of cataract extraction after preliminary subluxation with the capsule forceps. In 40, the cataract was mature; in 27, nuclear and postcortical; in 15, complicated; in 15, hypermature; and in 3, of the morgagnian type. Vision after the operation was 20-20 in 56 cases, 20-30 in 18, 20-40 in 5, 20-50 in 1, 20-70 in 6, 20-100 in 2, 20-200 in 2, fingers in 4, hand movements in 3, light perception in 2, and absent in 1. The complications were macula cornea in 2 cases, vitreous opacities in 3, choroidal changes in the fundus in 6, old detachment in 1, optic atrophy in 4, and amblyopia in 1.

LESLIE L. MCCOY, M.D.

Puiguari, M. I.: Intracapsular Extraction of the Lens (Extracción intracapsular del cristalino). *Semana méd.*, 1931, xxxviii, 876.

The author reports his experience in 540 cases of forceps extractions of the crystalline lens. In 305 of the cases he practiced total extraction of the lens with suture of the conjunctiva and peripheral iridectomy or iridotomy; in 57, total extraction of the lens with suture of the conjunctiva and total iridectomy; in 62, total extraction of the lens with suture of the conjunctiva without iridectomy; in 116, total extraction of the lens with suture of the cornea and, in the majority, peripheral iridectomy. Total iridectomy was performed only in cases in which good dilatation could not be obtained or in which the patient's condition was such that complications on the part of the iris were to be feared. There is no doubt that extraction is facilitated by surgical enlargement of the pupil, particularly when the lens is large.

In spite of the brilliant cosmetic results obtained by extraction without iridectomy, the author believes that peripheral iridectomy or iridotomy should be performed. To obviate late hemorrhage into the anterior chamber, such as occurred in some of the cases with suture of the conjunctiva, he modified Elschmig's technique by practicing suture of the cornea with peripheral iridectomy or iridotomy.

Most of the results were excellent. However, in the majority of the cases he used Elschmig's technique. He employed Kalt's forceps at first, but later used Elschmig's forceps.

The results were positive in 419 of the 540 cases. In 121, they were negative; that is to say, the capsule ruptured and was partially removed, the procedure being like that in extracapsular extraction.

The patients were prepared very carefully. Anesthesia was induced by retrobulbar injection and conjunctival instillation, and the eyelids were immobilized by the technique of Van Lint. After the operation the eyes were covered with gauze wet with physiological salt solution and bandaged and the patient was kept absolutely quiet for forty-eight hours.

The author concludes from his results that, because of the deep anesthesia and absolute immobility of the eye which are now obtainable, the intracapsular operation can be performed without danger. Though it is somewhat more difficult than extracapsular extraction, he believes it will eventually become the method of choice because of its quick and excellent results and the fact that it is not followed by secondary cataract and therefore can be used for immature cataract.

AUDREY G. MORGAN, M.D.

Manes, A. J.: New Points in the Intracapsular Operation for Cataract. The Stanculeanu-Forok-Elschnig Method (Nuevas consideraciones sobre la operación intracapsular de la catarata. Procedimiento Stanculeanu-Forok-Elschnig). *Semana méd.*, 1931, xxxviii, 947.

The operation described is very valuable as it leaves the sphincter of the iris intact, the post-operative course is short, and vision two-thirds normal or even normal is obtained. The author discusses a few points in the operation which he thinks should be emphasized.

The effect of the retrobulbar injection depends on the general condition and the condition of the eye. In old persons it is sometimes necessary to operate immediately after the injection as the eyeball collapses quickly. In young adults the action is very slow, requiring ten minutes or more, but in children with traumatic cataract hypotension is brought about almost as rapidly as in old persons. This effect is not due to the novocain-adrenalin solution as it can be brought about also by the retrobulbar injection of physiological salt solution. The hypotensive action passes off in about fifteen minutes. The author believes that the effect is produced by the action of the retrobulbar injection on the ciliary ganglion which acts on the ciliary body through the sympathetic innervation. When the retrobulbar injection brings about collapse of the eyeball there is no tendency toward prolapse of the iris. If operation is performed at the beginning of collapse when there is marked hypotension, prolapse of the iris is not apt to occur.

The author systematically performs the Hess small marginal iridectomy as he finds that when this is done there is no danger of injury to the lens or the hyaloid membrane. If the iridectomy is very small, the vitreous fluid does not escape and the slight hemorrhage that sometimes occurs is of no importance. Of course, proper instruments and good illumination are necessary. If the iridectomy is too large, the pupil will be flattened transversely.

If a very careful technique is used, prolapse of the iris is not apt to occur unless the patient is restless and moves too much. It does not occur nearly so often today as before the introduction of the intracapsular operation and retrobulbar injection, when operation was performed by simple incision of the cornea and no suturing was done. The patient is always examined within twenty-four hours after the operation. If impaction of the iris is then found another retrobulbar injection and a myotic mixture of pilocarpine and eserine are given and heat is applied by means of an electrical thermophore. If the prolapse has occurred within a few hours, there has been no time for adhesions to form and the hypotensive action of the retrobulbar injection combined with the powerful mydriatics and the action of the heat will reduce it. The best method of preventing prolapse is a careful technique with iridectomy.

Careful preparation of the pupil is important. Different persons react very differently to mydriatics. The mydriatic action increases with time. When the author has given the mydriatic to several patients at once he has found that the pupils of those who were operated upon first were dilated satisfactorily whereas the pupils of those who were operated upon later showed excessive dilatation. He always prepares the pupils himself and operates as soon as the proper degree of dilatation is reached.

Postoperative vomiting occurs occasionally, but is not frequent. It was rare after the older methods of operation. Manes attributes it to the action of the retrobulbar injection on the ciliary ganglion.

When the pupil is very small the day after the operation because of sensitivity of the iris to myotics, no medication should be given as the effect of the myotic will pass off in a few days.

AUDREY G. MORGAN, M.D.

Pavia, J. L.: Detachment of the Retina (Desprendimiento de la retina). *Rev. oto-neuro-oftalmol. y de ciruj. neurol.*, 1931, vi, 147.

The treatment of detachment of the retina is intimately related to the pathogenesis of the condition. The local condition is a result of a general condition. It may be caused by endocrine disturbances; diseases of the nose and sinuses; infections such as syphilis, tuberculosis, and rheumatism; diathesis; or heart or kidney disease. The author discusses a case in which septic pyæmia caused changes in the pigmented epithelium followed later by involvement of the uveal tract.

In the technique used by Gonin in cases of detachment of the retina the rupture is localized ophthal-

mologically. If it is at the posterior pole, photography is used. After its discovery its site is marked on a model and a perforating cauterization is performed. A rupture is present in almost all cases. The rupture may be very difficult to find and is generally overlooked in an ordinary examination of the eyeground. It is obscured by opacities of the lens in old persons and by the changes in the vitreous which are common in myopic subjects. Therefore every point of the retina should be examined with care and the relation of the site of the rupture to the disk, the macula, and the ora serrata determined accurately. The article contains charts showing how the location of the rupture may be recorded.

The author reports a case of detachment of the retina in detail, describing the method of locating and recording the site of the rupture and including stereoscopic photographs which were of aid in locating it.

AUDREY G. MORGAN, M.D.

Doggart, J. H., and Shapland, C. D.: Simple Detachment of the Retina. *Brit. J. Ophth.*, 1931, xv, 257.

Gonin has been doing ignipuncture for detachment of the retina for twenty-five years. Iridectomy, retinal suture, choroidodialis, sclerectomy, and other operations have been tried, but have not proved very successful. Gonin and other ophthalmic surgeons have reported a larger number of successes from ignipuncture than from any other procedure. Gonin believes the detachment is due to the passage of fluid from the vitreous into the intraretinal space through one or more holes in the neural layers of the retina, and that closure of these holes is essential for cure. He believes that the hole is due to isolated or multiple foci of anterior choroiditis and that whether the latter is due to myopia, senility, syphilis, sepsis, of some other condition, it produces degenerative changes in the vitreous body, causing it to separate into a pulp portion and a fluid portion.

The foci produce localized adhesion of the vitreous pulp to the retina, and when these adhesions are above the pulp they drag on the retinal surface. A slight pull may produce merely photopsia, but a heavier tug may tear the retina, thereby allowing the vitreous fluid to pass into the intraretinal space. Whenever the diagnosis of simple detachment is made, both eyes should be investigated up to the extreme visible limit of the periphery with the aid of mydriasis. The vision and visual fields, the state of the iris and media, and the shape, size and situation of the detachment and any landmarks in its neighborhood such as pigment accumulation or retinal hemorrhages must be recorded. Repeated examinations should be made until the hole is found. Holes occur most frequently in the periphery of the retina between the equator and ora serrata, especially in the superior temporal quadrant.

The prognosis is most favorable when the detachment is of only a few weeks' duration. Gonin obtained a successful result in 70 per cent of a series of thirty cases seen within three weeks of the onset

and in 50 per cent of cases of from one to three months' duration. The prognosis is more favorable in cases of single small holes without gross vitreous opacities and uveal disease. Before operation it is necessary to know: (1) the distance of a hole from the ora serrata, and (2) the meridian passing through the middle of the hole.

The modification of Gonin's technique used at the Royal London Ophthalmic Hospital (Moorfields) is as follows:

Before the operation, two marks are tattooed with India ink at diametrically opposite points of the limbus in line with the estimated position of the hole.

The eye having been cocaineized, about 0.5 c.c.m. of a mixture of equal parts of 4 per cent novocain and a 1:5,000 solution of adrenalin are injected beneath the ocular conjunctiva at the site determined for the cautery puncture. After an interval of five minutes, a knotted guiding thread is passed through the episcleral tissue at the limbal pigment mark remote from the side of the retinal hole. The ocular conjunctiva is then divided at a point about 0.5 cm. from the pigment mark on the side adjacent to the retinal hole and is incised for a distance of about 1.5 cm. so that the incision is parallel with the tangent to the arc of the limbus at the pigment mark. Tenon's capsule is opened and the sclera bared over the required situation. The guiding thread is passed through a hole punched in the center of the blade of a Desmarres retractor which is placed in the conjunctival wound and retracted. The guiding thread is then arranged so that it passes from the first tattoo mark across the center of the cornea over the second pigment spot and its prolongation crosses the site of the retinal hole. The predetermined distance of the retinal hole from the limbus is marked on the exposed sclera with a pair of calipers, one point of which has previously been dipped in sterilized India ink. Two or more conjunctival sutures are inserted in the cut ends of the ocular conjunctiva and the guiding thread is withdrawn. With an electric cautery at white heat, a way is then seared through the sclera at the point determined and, as soon as the subretinal fluid has escaped, the cautery is again heated up to white heat, plunged through the opening in the sclera so made, and immediately withdrawn, the average depth of penetration being 1 cm. and the duration of the cauterization two seconds. The conjunctival sutures are then immediately tied off, the speculum is removed, and double bandages are applied.

In the after-treatment the patient's head is so placed that the hole is in the most dependent part of the eye. Thus, if the site of the rent was at 6 o'clock, an upright posture is adopted, whereas if it was at 12 o'clock, the foot of the bed is raised on 18-in. blocks and no pillows are allowed. The patient is advised of the necessity for absolute rest. On the fourth day after the operation the bandages are removed, the lids cleaned, and a drop of 2 per cent atropine is instilled into the affected eye. Both eyes are then again bandaged.

On the eighth day another drop of 2 per cent atropine is instilled in the eye operated upon, the conjunctival sutures are removed, and the fundus is examined. If the detachment is as extensive as before the operation and there is no sign of improvement, the bandages are not re-applied and the patient is allowed up. If, on the other hand, the detachment is less extensive or if the retina is in place, both eyes are again bandaged and the patient is kept at absolute rest for three days longer. At the end of that time atropine is again instilled in the eye and the fundus is re-examined. Whatever the condition of the retina, the patient is then allowed to get up and both eyes are uncovered.

A fortnight after the cautery puncture the eye operated upon is thoroughly examined in a dark room and special note is made of the site and size of the cautery scar, its relation to the retinal rent, the extent of retinal detachment, if any, and the state of the vitreous. If the retinal hole has been sealed and the detachment is back, the field of this eye is charted and the patient is discharged. In the majority of cases, however, one cautery puncture fails to effect a cure either because the tear was not localized exactly or was too extensive to be sealed by one cautery puncture. Under such circumstances one or more additional operations must be undertaken.

During 1930 at the Royal London Ophthalmic Hospital (Moorfields) seventy-five patients with retinal detachment were subjected to the operation by cautery puncture by Gonin's method. Twenty-four were discharged with the retinal detachment back and the visual field full and twelve showed improvement in the visual field or visual acuity. In the thirty-nine others the condition was either unchanged or made worse. **LESLIE L. MCCOY, M.D.**

Brown, A. L.: Gonin's Cautery Puncture for Detached Retina. *Am. J. Ophth.*, 1931, xiv, 429.

The author reports three cases of spontaneous detachment of the retina. In one, the detachment was very extensive and although operation seemed to close the holes, useful vision did not return. In the two other cases both fields and central vision were restored practically to normal; central vision was ultimately 20/25 and 20/30.

Brown emphasizes the importance of localizing the retinal holes carefully and closing them completely with the cautery. In his cases in which a good result was obtained the tears were far out in the periphery. **THOMAS D. ALLEN, M.D.**

Bedell, A. J.: Angiomatosis Retinae. *Am. J. Ophth.*, 1931, xiv, 389.

The author reports three cases of angiomatosis retinae and supplements the case histories with photographs showing the evolution of the disease. The photographs show why the condition has been reported under so many different names. Of particular interest are: (1) the family history, (2) the dilatation of one or more veins, (3) whip-lash arteries,

(4) the color of the vessels, (5) vascular angiomas, (6) a retinal and subretinal exudate with later detachment, (7) vitreous opacities and a tendency toward uveitis, and (8) secondary glaucoma.

THOMAS D. ALLEN, M.D.

NOSE AND SINUSES

Stewart, J. P.: Congenital Atresia of the Posterior Nares. *Arch. Otolaryngol.*, 1931, xiii, 570.

This article reports a study of 2 cases of bilateral atresia and six cases of unilateral atresia of the posterior choana. The patients with bilateral atresia were sisters.

As the formation is developmental, its explanation must be sought in embryology. The buccopharyngeal membrane which separates the primitive mouth from the fore-gut is normally broken down and disappears during the third week of fetal life. Persistence of this membrane may lead to choanal occlusion. Eventually the olfactory tube is separated from the mouth by only a thinned-out membrane which breaks down and normally disappears at the end of the sixth week. Persistence of this membrane may also produce choanal atresia and is the most probable cause of membranous occlusion. Other causes are medial overgrowth of vertical and horizontal processes of palatal bone and intra-uterine inflammation.

Of the six cases of unilateral atresia reported, the right side was affected in the majority and the occlusion was osseomembranous in all. In every case the palate was high arched and narrow and adenoids were absent.

The two sisters with bilateral atresia showed the same high-arched palate and broad external nose. In both there was marked hypertrophy of the inferior turbinates and the nasal cavities were filled with thick mucus. The operative procedure on these patients consisted of submucous resection of the septum and breaking down of the posterior choanal atresia with the chisel and mallet. The posterior third of the septum was removed and the occluding membrane resected. The results were good, with restoration of nasal respiratory function.

JOHN F. DELPIT, M.D.

Harmer, D., and Russell, B.: The Treatment of Frontal Sinusitis by Intubation: An Analysis of Sixty-Three Cases. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 733. *J. Laryngol. & Otol.*, 1931, xlii, 384.

The authors describe their technique of treating frontal sinusitis by intubation.

Under general anesthesia an incision $\frac{1}{4}$ in. long is made just below the inner end of the eyebrow. The periosteum is reflected, the sinus opened with a gouge, the mucosa divided, and the secretion removed by suction. A probe or wire is then inserted through the opening and brought out outside the anterior nares, and a rubber catheter is drawn upward through the nose and anchored so that it will

not slip back into the nose. If it is impossible to use a catheter, the probe alone is left in place for a day or so until the congestion subsides sufficiently to allow the introduction of the tube.

The operation can usually be completed in fifteen minutes and causes so little shock that the patient is able to leave his bed after a day or two. Daily irrigations with saline solution are done and an increasingly larger tube is used so that the fronto-nasal duct will be gradually dilated. Especially in chronic cases, it may be necessary for the tube to be worn for several months.

The authors have found this method so simple, safe, and effective that they use it for all forms of frontal sinusitis which cannot be cured by intra-nasal treatment.

GEORGE R. McAULIFF, M.D.

Howarth, W.: The Treatment of Chronic Frontal Sinusitis. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 736.

The majority of acute inflammations of the frontal sinus tend to undergo spontaneous healing, but anything that militates against a free discharge of pus, such as septum deviations, enlargement of the middle turbinal, anatomical variations of the fronto-nasal duct, and viscid secretion will retard healing. In addition to free drainage, proper ventilation of the affected region is necessary.

While frontal sinusitis is often cured by an intra-nasal operation, external operation is sometimes necessary. Howarth noted that in certain cases of mucocoele of the frontal sinus all of the frontal sinus and the ethmoid cells were converted into one large cavity lined by modified mucous membrane, and that when this cavity was put into communication with the nose by a large opening no further trouble was experienced. Therefore in suppurative cases he forms a single cavity by removing the entire floor of the sinus (including orbital extensions), the os planum of the ethmoid, and the ethmoidal cells as far as the base of the skull and establishes drainage of the nose by removing a portion of the ascending process of the superior maxilla and the nasal process of the frontal bone. While this operation may not always cure, he believes that increasing skill in its performance will lead to successful results in a high percentage of cases.

GEORGE R. McAULIFF, M.D.

MOUTH

Freeman, N.: Histopathological Investigations of the Dental Granuloma. *J. Dental Res.*, 1931, xi, 175.

The dental granuloma is a chronic inflammatory lesion due to proliferation of the fixed tissue cells of the periodontal membrane and their infiltration by lymphocytes and leucocytes. It develops without the patient's knowledge whereas an acute alveolar abscess usually starts with symptoms of severe inflammation. Dental granulomata are of two types: (1) those surrounded by a fibrous capsule without

the presence of epithelium, and (2) those containing epithelium in the form of a network.

Dental granulomata are usually diagnosed by roentgen examination. They have the most striking appearance of all dental abnormalities except dentigerous cysts and dental tumors.

The simple dental granuloma is surrounded by a fibrous capsule which varies in thickness. As there is a direct communication between the inner part and the circulation, the capsule does not prevent the absorption of bacteria and toxins. The interior of the granuloma appears at first to be a great mass of plasma cells. Necrosis may occur in one or two places. Necrosis is followed by the appearance of polymorphonuclear cells in great numbers. The pus which is then formed is usually taken care of by the defensive forces of the body. Russell fuchsin bodies, which represent cells so loaded with hyaline that the nuclei are pressed to one side and nothing remains but the acidophilic hyaline, are found in from 80 to 85 per cent of cases. In some areas the connective tissue cells and fibers undergo degeneration, the cells becoming "foamy" and resembling those of xanthoma of other regions of the body.

The squamous epithelium present in some granulomata is probably derived from the epithelial sheath of Hertwig. The cells remain as epithelial rests which have been demonstrated in normal periodontal tissue, undergo proliferation as the result of irritation from infection, and grow like a network throughout the lesion. Necrosis with cyst formation is apt to occur.

Of more than 200 dental granulomata which were examined histologically, approximately 45 per cent were devoid of epithelial tissue.

WILLIAM G. HAMM, M.D.

PHARYNX

Cunningham, R. L.: Normal, Absent, and Pathological Tonsils in Young Women: A Comparison of Histories. *Arch. Int. Med.*, 1931, xlvii, 513.

The author states that one-third of 12,530 women who entered the University of California between 1920 and 1929 had had an operation for removal of the tonsils, one-third were believed to have normal tonsils, and the remaining third had pathological tonsils, remnants of tonsils, or buried or projecting tonsils.

The group with normal tonsils and the group with pathological tonsils differed by insignificant percentages as regards the incidence of the following diseases and operations reported in the histories: measles, mumps, chicken-pox, whooping cough, scarlet fever, diphtheria, pneumonia, pleurisy, chronic colds, rheumatism, chorea, and operations for appendicitis, mastoiditis, enlarged cervical glands, and nasal conditions.

The group without tonsils gave a history of a higher incidence of all illnesses and operations than the group with normal tonsils and the group with pathological tonsils. This may be explained by the

fact that children who are often ill are the ones most frequently operated upon.

The incidence of illness before and after tonsillectomy suggested that removal of the tonsils had little influence in lessening susceptibility to most infections.

The age when the tonsils were removed had no influence on the total incidence of measles, mumps, chicken-pox, whooping cough, pneumonia, or influenza, but early removal seemed to have a slightly favorable influence on the incidence of scarlet fever and, to a less extent, on that of diphtheria. The findings with regard to the relation of the patient's age at the time of the tonsillectomy to the incidence of chronic colds, rheumatism, and otitis media were inconclusive.

Although tonsillectomy is a common operation, the literature yields relatively little accurate information regarding its effect on the general health. Opinions as to the indications for, and the value of the operation differ very widely. There is a growing tendency to question the value of tonsillectomy as a prophylactic measure against infectious diseases and as a preventive measure and method of curing such systemic diseases as rheumatism, chorea, and carditis.

JAMES C. BRASWELL, M.D.

Alonso, J. M.: Chronic Tonsillitis (Amygdalite chronique). *Arch. internat. de laryngol.*, 1930, xxvi, 1025.

The tonsils develop in the small fossa of the palatine arch during the third month of fetal life. They are part of the pharyngeal mucosa modified by the growth of lymphoid tissue in the tunica propria of the mucosa. They may remain submerged or grow out on the surface. Some of the largest tonsils are of the latter type. Occasionally, bone and cartilage are found in the capsule. These are remnants of the branchial arches and may sometimes lead to neoplasm formation. According to Schultz, the follicles are not the site of origin of the lymphocytes, but the place where lymphocytes are destroyed.

The function of the tonsil has been the subject of controversy between physiologists and laryngologists. If the tonsil has only half of the functions attributed to it there is no other organ in the body which approaches it in importance. It is supposed to have a mechanical action in relation to the pharyngeal muscles and phonation. It is supposed also to have a defensive function. The author points out that it is not a lymph gland, but an accumulation of lymphoid tissue similar to Peyer's patches. It has only efferent lymphatics. It is thought to be a portal of entry for infection. Some have ascribed a hematopoietic function to it. However, this is of slight importance. It does not seem to produce any important internal secretion.

In discussing the bacteriology of the tonsils, the author states that the streptococcus hemolyticus is found most frequently in the crypts (from 50 to 90 per cent of cases). Americans frequently find the streptococcus viridans on the surface and occasion-

ally (4 per cent of cases) in the crypts. Davis has found the streptococcus viridans in 40 per cent of patients suffering from endocarditis. However, the streptococcus carriers are no more susceptible to tonsillitis than other persons.

According to the studies of Dietrichs, complete regeneration occurs after acute tonsillitis, but a certain amount of parakeratosis of the crypts persists. In chronic tonsillitis there is a re-infection from a latent focus. Acute tonsillitis is so frequent during childhood that normal tonsils are seldom found in adults.

Chronic tonsillitis may manifest itself as a simple hyperplasia which is soft (found frequently in children) or firm and fibrous (found in adults). In some cases the tonsil may be submerged and show a small septic focus near the capsule and a degeneration of the surface follicles.

In chronic tonsillitis there may be caseous plugs in the crypts, irritation of the pharynx, pain referred to the face, ear, neck, or shoulder, dysphonia, difficulty in swallowing, chronic cervical lymphadenitis, a reflex pharyngeal cough, aerophagia, or asthma. The condition may be associated also with gastro-intestinal distress (pyrosis, constipation), vertigo, recurrent phlegmon, fever, fatigue, or rheumatism, and may cause glomerulonephritis, nephrosis, and other visceral complications. Sometimes the diagnosis of disease of the tonsils is difficult. The presence of numerous caseous plugs, congestion about the anterior pillars, and marked hypertrophy is suggestive of disease. Massage of the healthy tonsil causes a leucopenia. After massage of infected tonsils Alonso has observed a definite eosinophilia. Such diagnostic methods are to be used only in doubtful cases. The author presents a table giving the clinical diagnosis and the results of various diagnostic tests in 170 cases.

For the treatment of chronic tonsillitis, Alonso advises total extracapsular tonsillectomy. Dissection is best. For elderly persons and cases in which the usual tonsillectomy is contra-indicated, he recommends electrocoagulation of the tonsil.

JACOB E. KLEIN, M. D.

NECK

Margolis, H. M.: The Possible Significance of the Thymus Gland in the Syndrome of Hyperthyroidism. *Ann. Int. Med.*, 1931, iv, 1112.

Eighty-five cases of hyperthyroidism in which complete autopsy data were available were studied. Fifty-five of these cases were diagnosed as exophthalmic goiter, and thirty were diagnosed as adenomatous goiter with hyperthyroidism. In all but eight of the fifty-five cases of exophthalmic goiter some degree of hyperplasia of the thymic parenchyma was noted. Of the thirty cases of adenomatous goiter with hyperthyroidism, sixteen showed some degree of hyperplasia, whereas fourteen showed advanced involution without any evidence of hyperplasia.

Margolis concludes that the thymus gland frequently presents parenchymatous hyperplasia in hyperthyroidism. In general, the degree of hyperplasia is much more pronounced in cases of exophthalmic goiter than in cases of adenomatous goiter with hyperthyroidism.

Cortical hyperplasia is most common with exophthalmic goiter, although medullary hyperplasia alone or combined with cortical and medullary hyperplasia, also occurs. In hyperfunctioning adenomatous goiter, medullary hyperplasia is most characteristic.

An increase in the number and in the size of Hassall's corpuscles is nearly always seen in glands showing parenchymatous hyperplasia.

True hyperplasia of the thymus gland may not be inferred merely from an increase in the gross weight of the gland. Histological studies are essential to confirm such a diagnosis.

Hyperplasia of the thymus gland may be the expression of an inherent predisposition to the development of hyperthyroidism. The degree of such hyperplasia may be roughly proportional to the degree of the susceptibility to the development of the disease.

It is impossible at present to evaluate the direct physiological relationship that may exist between the thymus and thyroid glands in the syndrome of hyperthyroidism.

Noehren, A. H.: The Results of Thyroidectomy. *Ann. Surg.*, 1931, xciii, 1045.

The author reports the results after three months of 108 thyroidectomies performed on 100 patients. Satisfactory improvement or complete cure was reported in 93 per cent of the cases.

An average pulse rate of 104½ before the operation was reduced to 87 after the operation, and 87 per cent of the patients showed a reduction of the pulse rate or continuance of a normal pulse rate.

Sixty-seven of the patients gained an average of 9 lb., while 9 lost an average of 6 lb. after the operation. Eighty-nine per cent either gained weight or retained their normal weight.

An average basal metabolic rate of 25+ before the operation was reduced to 8+ after the operation. Eighty-four per cent of the patients showed either a reduction of the basal metabolic rate or continuance of a normal rate.

The incidence of cure three months after the operation is estimated by the author at between 80 and 90 per cent. Noehren believes that after a longer period of time some of the patients may develop a recurrence, whereas others who were not benefited by the operation in three months will show improvement.

The operative mortality having been only 1 per cent and the incidence of cure three months after the operation being between 80 and 90 per cent, the author concludes that thyroidectomy offers the best chance of cure in most cases of goiter.

R. V. B. SMITH, M.D.

Pack, G. T., and Craver, L. F.: Tumors of the Larynx and Thyroid: A Roentgenographic Study. *Arch. Otolaryngol.*, 1931, xiii, 658.

The authors made roentgen studies of the changes produced in the larynx, pharynx, and trachea in eighty cases of laryngeal, pharyngeal, and thyroid tumors. Lateral views of the neck were preferred. The technique used is described.

The normal appearance of the structures in a roentgenogram is constant and definite. The lumen of the pharynx, larynx, and trachea resembles a pistol. The uvula is often seen as a finger-like pendant structure. The posterior dorsum of the tongue is clearly visible as it terminates in the epiglottic valleculæ. The epiglottis is distinctly concave anteriorly and appears to project between the wings of the hyoid bone. The vestibule of the larynx appears as an irregular triangular air space anterior to the pharynx. The ventricles of Morgagni are oval clear spaces in the anterior segments of the thyroid cartilage which are visible under certain conditions. The vocal cords are recognized as forming their upper borders. The thyroid and cricoid cartilages and the tracheal rings are demonstrable, but vary in the character and degree of calcification and ossification with the age and sex of the subject.

The authors' findings in pathological conditions of the larynx and thyroid are summarized as follows:

1. Lateral roentgenograms reveal the antero-posterior compression, tracheal stenosis, and tracheomalacia produced by certain types of goiter and by tumors of the thyroid gland.

2. Lateral roentgenograms of the neck show the outlines of retropharyngeal tumors. Some of these growths are inflammatory, whereas others are neoplastic, e.g., neurogenic.

3. In tuberculosis of the larynx the outline is hazy and indistinct because of the invasion of the soft parts and the rarefaction of the ossified cartilages. Syphilis of the larynx is characterized by sharp, distinct ossified areas due to proliferation of bone.

4. Carcinomata of the base of the tongue, valleculæ, epiglottis, and aryepiglottic folds produce a characteristic roentgenogram by distorting the lateral silhouettes of these structures.

5. Intrinsic laryngeal cancers obliterate the light oval areas in the roentgenogram which represent the ventricles of Morgagni.

6. A peculiar punched-out appearance of the thyroid cartilage seen in the roentgenogram is almost specific for laryngeal cancer.

7. Carcinoma of the thyroid may perforate the trachea to form an intratracheal tumor which is easily visualized in the roentgenogram.

JOHN H. WOOLSEY, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Rand, C. W.: Histological Studies of the Brain in Cases of Fatal Injury to the Head: I. Preliminary Report. *Arch. Surg.*, 1931, xxii, 738.

Rand reports the morphological changes found in the brain in sixty-one cases of fatal injury to the head. As the striking feature of all brain injuries is an increase in fluid (œdema), he reviews the theories of cerebrospinal fluid formation.

In the cases reviewed the choroid plexus showed marked œdema of the basement membrane and vacuolization of the cells. The ependyma presented marked œdema of the subependymal layer with varying vacuolization of the cells themselves. The perivascular and pericellular spaces of the brain substance showed considerable distention. Many believe that the fluid filling these spaces in œdema of the brain reaches them by a reversal of the normal flow of cerebral fluid from the subarachnoid spaces. They therefore assume a communication between the perivascular and pericellular spaces. In the author's opinion, the mechanism is an escape of fluid through the semipermeable membrane walls of the finest capillaries, resulting in an increased flow of fluid by way of the perivascular and pericellular spaces in a normal direction toward the subarachnoid spaces.

LEO M. DAVIDOFF, M. D.

Daddi, G.: Studies of the Microglia (Studi sulla microglia). *Sperimentale*, 1931, lxxxv, 5.

Daddi demonstrated the phagocytosis of fat by the microglia cells in experiments on rabbits. He injected from 0.20 to 0.40 c.cm. of sterile olive oil into the carotid artery and sacrificed the animals after three, fourteen, eighteen, and twenty-four hours.

Sections of the cerebral hemisphere on the injected side of the animal sacrificed after three hours showed numerous droplets of fat in the microglia cells which were situated near the vessels containing the fat emboli. Histological examination of the surrounding nervous tissue disclosed no evidence of a process of degeneration that might have explained the presence of these fat droplets in the microglia cells.

Fourteen hours after the production of the emboli, the walls of the obstructed blood vessels contained fat granules and the astrocytes located near these vessels contained similar granules in their bodies and processes.

After from eighteen to twenty-four hours there was no trace of fat in the microglia or astrocytes, but there were areas of focal necrosis due to the presence of the fat embolus.

The author believes that the lipophagocytic activity of the microglia cells is analogous to the activity of the cells of the reticulo-endothelial system. He states that although the astrocytes seem to possess the property of actively absorbing fat, conclusive experimental proof of this property requires further study.

PETER A. ROST, M.D.

Balado, M., and Puiggari, M. I.: Ophthalmological Signs in Neurological Surgery (Consideraciones oftalmologicas en cirugía nerviosa). *Semana méd.*, 1931, xxviii, 1081.

The authors discuss cases in which the patient is sent to the ophthalmologist on account of eye symptoms and ophthalmological examination reveals a lesion of the central nervous system requiring operation. They have seen some extremely interesting cases of œdema of the disk not due to tumor, a case of œdema of the disk due to a tumor of the hypophysis, and a case of œdema of the disk due to a tumor of the pineal gland.

In the cases of œdema of the disk without tumor there were signs of intracranial hypertension and sometimes focal signs. Vision was decreased. In some instances there was rapid loss of vision without any pronounced changes in the eyegrounds. In others, the decrease of vision was gradual and accompanied by obvious ophthalmoscopic changes. Some of the patients suffered from intense headache, vomiting, and mental dullness, and some showed clonus of the patella and one ankle without Babinski's sign. Others presented distinct signs of cerebellar involvement such as asynergy, ataxia, tremor, inability to stand, and adiadokinesis. Some complained of buzzing in the ears and showed a certain amount of mental excitement. In all of the cases the intracranial pressure was increased and the spinal fluid findings were negative. Roentgen examination with the aid of lipiodol showed that the ventricles were small but normal in shape. Tumor was therefore excluded. The authors attributed the small size of the ventricles to diffuse œdema of the brain. This theory was confirmed by the fact that on decompressive trephination in the right temporal region the brain herniated through the wound and the hernia could not be reduced by puncture of the ventricle. In the authors' opinion, the œdema must have been caused by a previous infectious disease not known to the patient. The latter could not have been syphilis as specific treatment had no effect on the œdema. Neither could it have been tuberculosis of the brain or meninges as this condition is generally rapidly fatal. Widmer attributed the œdema to epidemic encephalitis and reported ten cases in support of his opinion. The authors were unable to find the cause, but their patients recov-

ered after the decompressive trephination in the right temporal region. They state that when operation is performed early enough the prognosis is good both as to life and vision. They report eight illustrative cases.

AUDREY G. MORGAN, M.D.

Spota, B. B.: Extracortical Jacksonian Epilepsy from an Epithelioma of the Choroid Plexus—a "Neuro-Epithelioma" (Síndrome de epilepsia jacksoniana extracortical por epitelioma de los plexos coroides—"neuro-epitelioma"). *Semana méd.*, 1937, xxxviii, 805.

In May, 1929, a man forty-five years of age began to experience difficulty in writing. Soon thereafter, his right arm became weak and developed absolutely flaccid paralysis. On July 10 a convulsive attack occurred in the right arm. At about the same time, weakness of the right leg began to cause difficulty in walking and an intense headache developed in the left parietal region and irradiated to the frontal and occipital regions. After the patient was admitted to the hospital he had five or six convulsive attacks at intervals of a few days. The right hemiplegia became intensely painful. Consciousness was retained during the convulsive attacks. The symptoms mentioned, together with intracranial hypertension and choked disk, led to a diagnosis of tumor of the left Rolandic region, chiefly in the middle part of the ascending frontal convolution.

Operation was performed on September 25. Death occurred four days later. Autopsy disclosed a tumor in the opstotriate region of the left hemisphere. The external border of the neoplasm extended as far as the island and the internal border penetrated the left lateral ventricle. There was marked dilatation of the occipital prolongation of the left lateral ventricle. The dilated left ventricle was filled with the choroid plexus. In the substance of the tumor there were cells of an epitheliomatous appearance similar to the epithelium of the choroid plexus. The histological appearance of the tumor is described in detail and shown by photomicrographs.

AUDREY G. MORGAN, M.D.

SPINAL CORD AND ITS COVERINGS

Paitre: Osseous Neoformations of the Dejerine Type in a Case of Dissociation Paralysis of the Sciatic Nerve (Néoformations osseuses de type Dejerine dans un cas de paralysie dissociée du sciatique). *Bull. et mém. Soc. nat. de chir.*, 1932, lvii, 325.

In the case reported by Paitre there was a wound of the sciatic nerve and the femoral artery dating back fourteen years. This double lesion had caused the usual motor, vasomotor, and trophic disturbances. In addition, there were osseous neoformations which were particularly developed in the leg.

Traumatic and inflammatory causes and disturbances of the central nervous system such as tabes being ruled out, it seemed justifiable to attribute the osseous neoformations to the vasculoneural wound.

As these formations were discovered only accidentally in the course of a complete roentgenographic and clinical examination, it is possible that such lesions often pass unperceived in cases of injuries of nerves and vessels in which a roentgen examination is not made. The osseous neoformations in the author's case bore a striking resemblance to those found by Dejerine in 49.37 per cent of paraplegias resulting from war wounds. In some of the cases reported the osseous neoformations appeared from forty days to two months after the injury. It seemed probable that they developed in the first months or weeks after the medullary lesion and reached their maximum size in a few months. They are found in the paralyzed limb, especially around the joints. Sometimes they extend the entire length of the diaphysis, and in some cases are disseminated in the soft parts and the muscular interstices. Their form is variable and irregular.

In Paitre's case, unlike the cases seen by Dejerine, the neoformations were paradiaphyseal instead of para-articular, and the skeletal portion of the limb had reacted, the internal surface being thickened by a fine layer of periosteum. The neoformations were related to the nerve lesion, but the initial lesion was in the trunk, not in the medulla. The injury to the sympathetic filaments which accompany the sciatic nerve and the femoral vessels brought on important vasomotor disturbances, and the circulatory disturbance caused by the wound of the femoral artery itself had a similar effect. The ossifiable medium being thus prepared, osseous neoformations were easily produced. The only difference from the osseous neoformations of paraplegia was that the peripheral sympathetic tracts instead of the central sympathetic tracts were involved.

PAGE.

Massart, R.: Incontinence of Feces Dating from Infancy; Ablation of a Fibrous Nodule After Laminectomy; Recovery (Incontinence des matières datant de l'enfance. Ablation d'un nœud fibreux après laminectomie. Guérison). *Bull. et mém. Soc. nat. de chir.*, 1932, lvii, 171.

The case reported was that of a girl nine years old who had had incontinence of feces since the age of two years. The findings of roentgen examination suggested non-union of the posterior arches of the fifth lumbar and first sacral vertebrae. Operation showed that the defect seen in the roentgenogram was not an osseous breach but a lateral fissure filled with fibrous tissue. When the osseous and ligamentous covering was detached from the spinal dura mater an adherent zone was found between the cul-de-sac of the dura mater and the laminae. Separation of the fibrous tissue from the fatty meningeal covering required dissection. The fibrous tissue was avascular and formed a nodule the size of an almond. When the dural cul-de-sac was exposed it was found to be distended with spinal fluid and to have a nerve bundle attached to its posterior wall.

During the first three days after the operation there were no bowel movements. On the fourth

day an enema was given. The child remained continent, but had no bowel movements without enemas. In order to regulate defecation and bring back the defecation reflex, spaced applications of a low Leduc current were given. This treatment resulted in the progressive return of sensibility. Within two months after the operation the defecation reflex was re-established. PACE.

PERIPHERAL NERVES

Labat, G., and Greene, M. B.: A Contribution to the Modern Method of Diagnosis and Treatment of the So-Called Sciatic Neuralgias. *Am. J. Surg.*, 1931, xi, 435.

Pain traveling along the posterior aspect of the thigh and various other ill-defined painful conditions of the lower extremities are diagnosed and treated as sciatica or sciatic neuralgia. They are usually ascribed to disease of the spine or focal infection. Frequently they remain undiagnosed. Symptomatic treatment by many methods, including the use of narcotics, is the general rule.

In the authors' cases a complete physical examination, including roentgen examination of the spine, is made and foci of infection are cleared up. The paths of the painful impulses are then traced with the aid of an electrical percussion hammer, marked on the skin, and photographed, and the individual nerves involved are blocked by the paravertebral technique with alcohol and neocaine solutions.

With the use of the percussion hammer it is possible to differentiate between painful conditions of the external cutaneous, anterior crural, and the great and small sciatic nerves. This differential diagnosis is of great importance as it allows the substitution of individual blocking of the nerves for the classical caudal or epidural block which may cause impairment of the vesical or anal sphincters or weakness of both legs. The individual block improves the circulation of the affected side and gives greater comfort.

There is no general rule for the injections, but the authors believe it is best to use no more than 5 c.cm. of 95 per cent alcohol in a concentration of 33 per cent or less in 1 per cent neocaine solution. They inject from 2 to 10 c.cm. of this alcohol-neocaine solution for each nerve.

The injections are followed first by sensations of stinging, burning, heat, pressure, or pricking, and after a variable number of days by numbness. Mental characteristics have a great deal of influence on the maintenance of these sensations. Diathermy, infra-red rays, and massage often aid recovery, but some patients need only an explanation of the sensory changes which they may experience.

Many of the patients treated in the manner described were becoming or had become drug addicts. The substitution of nerve blocking for narcotics is a marked advance in the treatment of sciatic neuralgia. Pain associated with productive osteo-arthritis may also be relieved by alcohol-neocaine nerve blocking.

The duration of the relief cannot be foretold, but the results are encouraging and indicate the continued use of this method of treatment.

E. S. PLATT, M.D.

SYMPATHETIC NERVES

Cotte, G., and Dechaume, J.: Hypogastric Plexalgias (Les plexalgies hypogastriques). *Presse méd. Par.*, 1931, xxxix, 373.

The authors believe that pain and functional disorders of the pelvic organs unexplained by an organic lesion may be due to histopathological changes in the hypogastric plexus. They base this theory on twenty-two cases of pelvis disorders in which anatomopathological studies were made.

In one case, in which presacral nerve resection performed by another surgeon for severe dysmenorrhœa was followed by relief for three months, operation for recurrence of the symptoms revealed a cicatricial neuroma of the hypogastric nerve. Histological studies showed that the hypogastric nerve had been incompletely sectioned at the previous operation.

In the twenty-one other cases the symptoms included dysmenorrhœa, dyspareunia, pelvic pain, vaginismus, and states of genital hyperexcitation. In eleven of these cases exploratory operation disclosed no lesion at the level of the resected presacral nerve, but in ten it revealed nerve lesions characterized by: (1) congestion of the nerve, (2) microscopic hæmorrhages in the nerve tissue, (3) œdematous distention of the tissues about the nerve, (4) an inflammatory appearance of the nerve fibrils, and (5) the presence of considerable sclerotic tissue within the nerve. In only three cases were there nearby lesions which could have explained these histopathological changes. The lesions apparently began as a vasodilatation which progressed through the exudative stage with gradual transformation of fibrin into fibrous connective tissue.

The authors believe that, in young women, primary hypogastric plexalgias are often associated with anemia of adolescence, colitis, a tendency toward neuro-arthritis, humoral or endocrine conditions, syphilis, tuberculosis, or some intoxication such as alcoholism. They consider these conditions etiological factors and advise medical treatment for their correction before the stage of organization of the hypogastric nerve lesions. They believe that the hypogastric nerve findings which they report are alone sufficient for intervention on the presacral nerve.

JAMES B. MASON, M.D.

Gasparjan, G.: Ganglioneuromata of the Sympathetic Nervous System of the Abdominal Cavity (Zur Frage ueber Ganglioneurome des sympathischen Nervensystems der Bauchhoehle). *Nov. chir. Arch.*, 1930, xx, 399.

Ganglioneuromata of the peripheral nervous system are rare, the author being able to find only fifty-seven cases in the entire literature. Ganglio-

neuromata of the abdominal sympathetic nervous system are still more rare, only nineteen cases having been recorded. To the latter, a case operated upon by Fedorov should be added.

Ganglioneuromata are tumors having their origin in a blastomatous proliferation of the ganglion cells. According to their microscopic structure, they consist chiefly of nerve fibrillæ with or without myelin, which form wave-like or felt-like reticulated nerve bundles. In this network there are single ganglion cells and groups of ganglion cells. Some of the nerve fibrillæ are supplied with a Schwann sheath. Macroscopically, the ganglioneuromata are yellowish-white oval tumors which are smooth or nodular and hard. They usually have no capsule. They are surrounded by loose connective tissue. As a rule they are retroperitoneal and originate in the left funiculus marginalis of the sympathetic nerve. They are usually of considerable size, varying between that of an apple and that of a man's head.

Of eleven patients with such neuromata, six were females and five were males. Three were between three and five years of age; four, between sixteen and twenty-five years; and four, between forty-four and fifty-seven years.

Ganglioneuromata present no uniform symptoms. Sometimes the patient calls attention only to a tumor and sometimes he complains of severe colic in the intestines, kidneys, and pancreas which cannot be linked up with any organic affections of these

viscera. Occasionally the findings of all laboratory and clinical methods of examination are negative and laparotomy alone shows the true condition. Ganglioneuromata may undergo malignant degeneration and form metastases. Not rarely, they are very closely related to the large blood vessels of the abdominal cavity and consequently cannot be entirely removed. Their cause is still unknown.

The author reports the case of a man twenty-three years of age who was operated upon for a large, oval, slightly movable, hard tumor in the right half of the abdomen. Laparotomy revealed a large tumor of the retroperitoneal space which included the inferior vena cava. Partial resection of the tumor was done. The patient remained cured during the two years and five months he was under observation. Microscopic examination showed the tumor to be a ganglioneuroma. G. ALIPOV (Z).

Coates, A. E., and Tiegs, O. W.: Sympathetic Ramisection and the Treatment of Spastic Muscle. *J. College Surg. Australasia*, 1931, iii, 346.

The authors present convincing evidence from many sources that the sympathetic nervous system does not innervate plastic tonus in the limb musculature. They therefore conclude that the successful results obtained by sympathetic ramisection in the treatment of spastic muscle are due, not to the removal of plastic tone by the operation, but to some undetermined effect.

DAVID J. IMPASTATO, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Cappell, D. F.: Observations on Cancer of the Breast in the Light of Experimental Cancer Research. *Glasgow M. J.*, 1931, cxv, 181.

The development of coal-tar cancer which is caused by an irritant "carcinogenic agent" acting on normal epithelium is always a slow epithelial hyperplasia followed, in highly specialized organs such as the hair follicles and sebaceous glands, by loss of the differentiated elements. The cells become larger, mitotic figures develop, and finally migration into the dermis occurs. The development of the experimental cancer is therefore a slow transition from previously healthy epithelium; malignant propensities are acquired only gradually. Accordingly, there must be a stage at which the epithelium has acquired the essentially malignant properties without having as yet demonstrated them by local invasion. Some fundamental change in the behavior of the cells is brought about while the epithelium still retains its normal relations to the underlying connective tissues. The actual breaking through into cyst and lymph spaces is dependent upon a primary change in the epithelium, and this may be accompanied by striking changes in the morphology of cells, such as hyperchromatic nuclei and irregular mitotic figures.

The author describes similar changes in breast cancer and discusses their relation to chronic cystic mastitis.

In practically all breasts removed for cancer there is some degree of chronic cystic mastitis or, in reality, epithelial hyperplasia. Cystic dilatation of the terminal ducts and acini with proliferative changes in the lining cells is followed by filling of the lumen with solid epithelial sheets of clear, glassy cytoplasm. At some places the cytoplasm becomes abundant, and hyperchromatic nuclei, irregular mitotic figures, and variations in the size of the cells are found. The cells within the duct, though still confined to their normal boundaries, pass all the cytological stigmata of degeneration and are identical with many frankly invasive cancers found in interstitial tissues. This condition has been termed by Muir "intraduct cancer." The walls of the duct, especially the elastic layers, become thickened and sclerotic.

The neoplastic cells may remain within the affected ducts for a long time, and may spread up into the ducts of the nipple and down into the acini. Finally they break through their natural boundaries and invade the breast substance. This usually occurs first in the region of the acini, which have much less strongly protected walls than the ducts. It follows, therefore, that if the neoplastic changes

originate deep in the breast substance, the cells will spread to the acini at an early stage and scirrhous cancer will be apt to follow rapidly, whereas if the duct changes begin high up near the lactiferous sinuses and main ducts of the nipple, a spread to the acini will not occur for a considerable time and the disease will be more likely to manifest itself in some other way, as by a discharge from the nipple or the development of Paget's disease. In the latter condition, as Paget himself stated (1874), it is common for carcinoma to appear deep in the substance of the breast at a later date, perhaps years after the affection of the nipple. It is evident that during this long interval the intraduct cancer cells spread slowly along the ducts and down into the acini, through which they finally burst to set up an invasive scirrhous carcinoma.

These changes in the mammary gland are analogous to the hyperplastic changes in tar cancer, and hence are indicative of an irritating substance in the mammary gland which leads to hyperplasia and neoplasia of the lining cells.

Tar injected into the main lumen of the mammary gland of rabbits caused neoplasia of the lining cells. In experiments on mice in which Bagg produced repeated milk stagnation and continued functional over-stimulation by ligation of the nipple and rapidly repeated breeding, spontaneous breast cancers were frequent.

Mammary cancer is largely attributable to the presence of an irritant within the ducts. This irritant is of unknown nature, but is probably derived from the breaking down of complex bodies in the stagnating secretion which is often found in the affected duct.

HARRY C. SALTZSTEIN, M.D.

TRACHEA, LUNGS, AND PLEURA

Lahey, F. H.: The Effect of Thyroid Pressure upon the Trachea. *Surg. Clin. North Am.*, 1931, ii, 459.

In the study of cases of goiter, Lahey finds roentgenograms of value for the following purposes:

1. The detection of intrathoracic and retrotracheal extensions of the goiter.
2. The differentiation between benign and malignant conditions.
3. The demonstration of the degree of pressure on the trachea.

The roentgenograms which are included in the article were taken in the anteroposterior and lateral positions.

In intrathoracic goiter the outline is discrete, the lower end of the mediastinal shadow is rounded, and the dislocation of the trachea is to one side rather than in an anterior or posterior direction.

JOHN H. WOOLSEY, M.D.

Buch, H.: Pulmonary Tamponade (Ueber Lungenplombierung). *Nord. Tuberk. lægefor. Forh.*, 1930, p. 77.

The author discusses the experiences of Sauerbruch in tamponade of the lung. He enumerates the various indications for this procedure as well as for the combination of tamponade and phrenicotomy. Sauerbruch considers this combination a possibility and Alexander calls it a "fortunate combination." It is to be considered in cases in which thoracoplasty cannot be undertaken because of the condition of the other lung or of the heart. The chief indication for tamponade alone is essentially unilateral phthisis with single, well-localized cavity-forming-processes in the upper lobe, possibly also in the middle lobe, after phrenicotomy, in which thoracoplasty cannot be done. The defects and dangers of the method are reviewed. Sauerbruch reports that in spite of all precautions, the plugs were expelled in 25 per cent of his cases. The dangers of pneumolysis are known.

Buch reports three cases of lung tamponade by the method of Ziegler. The composition of the plug was that recommended by Baer— $\frac{1}{2}$ per cent of bismuth carbonate and $\frac{1}{20}$ per cent of vioform, with a melting point of 48 degrees. The course of the condition in the three cases was similar at first, but after treatment was quite different. In Case 1, after partial resection of the second and third ribs near the spine and pneumolysis, which was easily accomplished, a plug the size of a man's fist (200 gm.) was inserted. One year later the patient was well and following his usual occupation and his sputum was free from bacilli. In Case 2, after partial resection of the second to sixth ribs, extensive adhesions were encountered and pneumolysis was impossible. Therefore, only resection of the first to ninth ribs and thoracoplasty were done. In Case 3, because of difficult pneumolysis, the resection of three ribs was necessary. A 70-gm. plug was introduced. After three afebrile days, aspiration pneumonia developed and the patient died. This is the first case of this type to be reported in the literature. GERLACH (Z).

Schauman, E. R.: Bilateral Artificial Pneumothorax (Doppelseitiger kuenstlicher Pneumothorax). *Nord. Tuberk. lægefor. Forh.*, 1930, p. 73.

The author reports fourteen cases in which bilateral pneumothorax was induced at the sanatorium of von Bonsdorff. In nine cases the two sides were collapsed alternately at different times and in five they were collapsed simultaneously.

From the first group one case is excluded because the period of observation following the second pneumothorax is still too short. Five patients were benefited by the treatment. One of the five became free from bacilli and able to work, and the four others became afebrile and gained in weight. One of the latter patients, however, gradually failed following a flare-up of the pulmonary process in the lung which was first treated six and one-half years

previously. This patient also suffered from gastric ulcer. In the three others who were apparently benefited the second pneumothorax was not complete. In the cases of three patients in the first group the desired effect was not obtained; intestinal and pulmonary tuberculosis complicated the condition and the lung which was treated primarily did not heal. In two of these cases the second pneumothorax was done at the request of the patient. In the eight cases of the first group an exudation in the second pneumothorax cavity was noted three times. In one it was attributed to separation of adhesions by the Jacobaeus method. In all of the cases the other lung was symptomless at the time of the first pneumothorax. The time which elapsed between the induction of the primary pneumothorax and the development of symptoms in the other lung varied from seven to sixteen months and the time between the first appearance of these symptoms and the induction of the secondary pneumothorax varied from five months to two years.

Of the five cases which were treated by simultaneous bilateral pneumothorax, one is excluded from the report because the observation period is too short. In two cases the treatment resulted in no benefit. Its failure was due to the patient's debilitated condition and to extensive adhesions which prevented adequate collapse by the pneumothorax. Both patients developed an exudate (one, on both sides) and soon died with severe dyspnoea. The cases of the two other patients are reported in detail. In one, tuberculous pneumonia developed and after repetition of the pneumothorax a transient exudation appeared. Later the exudation recurred, and three months after the beginning of the bilateral pneumothorax treatment the patient died. Extensive adhesions on one side had prevented pulmonary collapse. In the other case, pneumothorax was first induced on the right side and subsequently it was induced on the left side. In the meantime the right lung healed. After a year, because of recurrence of the disease, a simultaneous bilateral pneumothorax was performed. The patient was doing well at the time the article was written. In the author's opinion, the failure was due to a too lengthy interval before the second pneumothorax and to incomplete collapse resulting from unyielding adhesions.

In the discussion, VON ROSEN emphasized that pneumothorax is not contra-indicated by a recent process in the other lung. According to his experience, simultaneous bilateral pneumothorax gives better results (four out of five living) than the alternative method (two out of seven living).

GERLACH (Z).

Rosal, L., and Caralps Massó, A.: Section of Adhesions by the Jacobaeus-Mauer Technique (La sección de adherencias por la técnica Jacobaeus-Mauer). *Rev. méd. de Barcelona*, 1931, viii, 195.

Various procedures have been devised to overcome the adhesions which frequently interfere with complete collapse of the lung in artificial pneumo-

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Westerborn, A.: The Importance of Roentgenographic Examinations in Acute Cases of Circumscribed or Diffuse Peritonitis. *Surg., Gynec. & Obst.*, 1931, lii, 804.

Occasionally the symptoms of acute peritonitis are so obscure or unusual that an exact diagnosis from the clinical findings is impossible. This is true especially in the cases of small children and cases in which the inflammatory process has not subsided after operation and has caused the formation of intraperitoneal collections of pus.

For such cases the author recommends roentgen examination of the chest and abdomen. A barium enema may reveal an abscess pressing against the colon.

The presence of an inflammatory process in the abdomen is suggested by the following roentgen findings:

1. An appearance of ileus with an increase in the gas and fluid content and a decrease in the motility of the intestines.

2. A rounded outline of the meteoristic small intestine with streaks or wedges of exudate between the intestinal loops or between the intestines and the abdominal wall.

3. Fairly large homogeneous shadows in various parts of the abdomen in addition to those caused by the spleen and the urinary bladder. When it is surrounded by gas-filled intestinal coils, the small intestine, whether filled or empty, sometimes casts homogeneous shadows closely resembling those of an exudate.

4. Circumscribed gaseous abscesses, e.g., in the right iliac fossa.

5. Changes in the structure of the abdominal wall. As the result of the inflammation, the subperitoneal fatty layer becomes indistinct or even invisible, so that in the roentgenogram the abdominal wall appears more homogeneous, with blurred or vague contours and with its interior outline more indistinct than under normal conditions.

6. Diminished motility or paralysis of the diaphragmatic cupolas

7. Exudate in the sinus phrenicocostalis on one or both sides.

8. Disappearance of the shadow of the psoas muscle or, in rare cases in which the inflammation has spread into the retroperitoneal tissues, unusual distinctness of the blood vessels in the subcutaneous fatty layer.

The author reports several cases in which the diagnosis was made by means of the X-ray several days before it was possible from the clinical findings.

GEORGE A. COLLETT, M.D.

Wilmoth, P., and Patel, J.: Chronic Encapsulating Peritonitis (La péritonite chronique encapsulante). *J. de chir.*, 1931, xxvii, 341.

A woman thirty-eight years of age entered the hospital complaining of vague pelvic pains which radiated to the back. Menstruation had been for some time scant and irregular. A diagnosis of uterine fibroid and salpingitis was made. Operation disclosed a large white fibrinous sac enveloping a long loop of intestine. This membrane was removed. The patient made a good recovery and was still in good health eight months after the operation. Microscopic examination of the membrane showed evidence of intraperitoneal tuberculosis.

Similar cases have previously been reported in the German literature. Such membranes have been described as covering the liver and spleen. Of the thirty cases hitherto recorded, evidence of tuberculosis was found in only three.

The authors are unable to give an opinion as to the mode of origin of the condition or to state whether or not it represents a special type of peritoneal tuberculosis. HAROLD C. MACK, M.D.

Draper, J. W., and Johnson, R. K.: Observations on the Pathological Physiology of the Omentum and Duodenum. *Am. J. Surg.*, 1931, xii, 105.

Little is known regarding the function of the human omentum except that it has an absorbing and a bactericidal function. As the function of the omentum of quadrupeds is greater than that of the omentum of bipeds, the upright position of the biped has probably resulted in an atrophy of disuse.

The high absorption coefficient of omental tissue is due to the great vascularity and elasticity of this tissue. In the biped, resistance to peritoneal infection has developed largely in the pelvic peritoneum. Abnormal bands arising from the anterior mesogastrium and becoming attached to the right colon may compress the duodenum. Interference with duodenal function is serious. It may be reflex or due to mechanical factors. Partial obstruction of the duodenum causes the elaboration of toxic products which give rise to serious metabolic and neurological disturbances. Omentectomy is indicated when the omentum is definitely diseased or malformed.

JOHN W. NUZZUM, M.D.

GASTRO-INTESTINAL TRACT

Hernando, T.: Gastro-Intestinal Changes in Patients with Endocrine Disease (Alteraciones gastrointestinales en los enfermos endocrinos). *Prog. de la clin.*, Madrid, 1931, xix, 261.

From his study of gastro-intestinal symptoms in endocrine disease the author concludes that the

endocrine glands influence the digestive tract through the products which they pour into the blood, acting either directly on the glands and muscles or, more probably, through the vegetative nervous system. There seems to be no doubt that the digestive tract contains two hormones, gastrin and secretin, which act respectively on the secretions of the stomach and pancreas and on bile secretion. Among the pathological results of disturbances of gastric secretion are the hypochlorhydria following pylorotomy and possibly the hypersecretion in acute dilatation of the stomach. In cases of achlorhydria a decrease of pancreatic secretion from lack of secretin has been noted, but this is rare as the secretion is generally normal or increased because there are other nervous and humoral regulatory mechanisms for gastric and pancreatic secretion.

Among the endocrine disorders, diseases of the thyroid are most frequently accompanied by gastrointestinal disturbances. Hyperthyroidism is associated with increased appetite and thirst, various digestive disturbances, and sometimes severe vomiting. Generally, in hyperthyroidism, there is achlorhydria or hypochlorhydria, but in a few cases there is hyperchlorhydria. Sometimes there is constipation, but more frequently there is diarrhoea, which may become alarming. Sometimes the diarrhoea follows achlorhydria. In a few cases it is caused by changes in the pancreas, but in many is due to the direct action of the thyroid secretion, alone or combined with other products, on the vegetative nervous system or the wall of the intestine. Persons with hypothyroidism generally suffer from loss of appetite, hypacidity, and constipation.

Experimental thyroidectomy and tetany are usually followed by spasmodic digestive disturbances, vomiting, diarrhoea or constipation, and severe abdominal pain. These are all due more to the tetany than to parathyroid insufficiency.

Certain gastric and duodenal ulcers may be caused by parathyroid insufficiency. This theory is supported by the fact that tetaniform symptoms sometimes occur in cases of ulcer and ulcer is sometimes cured by parathyroid extract. The tetany seen in digestive diseases is probably caused by metabolic changes without lesions of the parathyroids.

In Addison's disease there are always digestive symptoms such as nausea, vomiting, gastric pain, and diarrhoea alternating with constipation. Gastric and duodenal ulcers have been produced experimentally by extirpating the suprarenals and have been found also in association with Addison's disease. Acute pseudoperitoneal abdominal symptoms have been noted in acute suprarenal insufficiency and as terminal symptoms in the chronic form of suprarenal insufficiency.

In diabetes, in addition to polyphagia and polydipsia, there are digestive disturbances such as gastric pain (which, however, is almost always caused by cholecystitis or cholelithiasis) and secretory symptoms. Some persons with diabetes have constipation and others have diarrhoea. The diarrhoea

is generally caused by achlorhydria and rarely by changes in the external secretion of the pancreas. Insulin has a stimulating action on gastro-intestinal motility and secretion. AUDREY G. MORGAN, M.D.

Bonorino Udaondo, C., Maissa, P. A., and Centeno, A. M.: The Roentgen Diagnosis of Chronic Gastritis (La radiología en el diagnóstico de las gastritis crónicas). Rev. Asoc. med. argent., 1930, xliii, 623.

The authors present a series of roentgenograms and discuss the roentgenographic signs of various types of gastritis. They believe that chronic gastritis is not as frequent as it appears to be as a number of conditions which are often classified as chronic gastritis are ordinary dyspeptic syndromes or due to secretory anomalies unrelated to inflammation of the gastric mucosa. The systematic application of roentgenography and of gastroscopic, cytological, and functional examinations has cleared up a number of the unknowns in the problem of chronic gastritis and has differentiated the disease from many of the conditions with which it has been confused.

Chronic gastritis represents the reaction of vulnerable tissues and can be demonstrated with the X-ray. The extent and condition of the inflammatory zone depend upon the cause and the susceptibility of the subject. Gastritis often evolves without symptoms.

The authors discuss recently reported findings with regard to the normal and pathological anatomy of the gastric mucosa and urge that serial examinations be made routinely of the gastric mucosa of normal persons to establish more definitely the variations possible within the physiological norm.

A study of the internal surface of the stomach is of considerable value, often making a probable diagnosis positive. However, roentgenography cannot always solve the diagnostic problem. In some cases a decidedly inflammatory appearance disclosed by the X-ray is not accompanied by confirmatory functional manifestations.

With discussing roentgenographic technique, the authors state that they consider the opaque medium recently advocated by Feissly (containing barium sulphate and albumin) of great value in the study of ulcerous gastritis. Their own examinations have been carried out by Gutzeit's method with insufflation (as Feissly advised) and the use of lacto-baryta or barium sulphate. When visualization of the duodenum and pylorus is desired, left or right lateral exposure is of value. Local compression, which is particularly advised by German roentgenologists, is indicated when it is desired to examine small areas such as the ulcerous region alone or the region surrounding the tumor. MARGUERITE P. SLOAN.

De Courcy, J. L.: The Management of Gastric and Duodenal Ulcer. Am. J. Surg., 1931, xii, 254.

The problems in the management of a case of peptic ulcer is to determine whether medical or surgical treatment is indicated.

Gastric ulcer of recent origin with no complications should first be treated medically. The author prefers the Sippy regimen.

Hæmorrhage, pyloric obstruction, recurrence of symptoms after medical treatment, perforation, and ulcer of the duodenum are indications for surgery.

From 60 to 80 per cent of peptic ulcers are duodenal. These ulcers occur more frequently in males than in females. In the female, ulceration is most common between the ages of twenty and thirty years, whereas in the male it is most common between the ages of thirty and fifty. Men suffer more frequently from chronic, indurated, and perforating ulcers than women. Jejunal ulceration follows from 2 to 10 per cent of gastro-enterostomies. Such ulceration is rare in infants and old persons.

A general symptom of peptic ulcer is chronic gastric disturbance of several years' duration, the attacks occurring periodically and lasting for from two to six weeks. The attacks do not incapacitate the patient for work or affect the appetite or state of nutrition. Epigastric pain and tenderness are present, but the pain is seldom severe or piercing. The rhythmic recurrence of the pain after a meal may serve to distinguish between gastric and duodenal ulcer. Gastric ulcer is characterized by the following sequence: food intake, a period of ease, and pain followed by a period of ease before the next meal. The pain of gastric ulcer occurs from fifteen minutes to two and a half hours after meals. In duodenal ulcer the sequence is: food intake, a period of ease, and pain which is constant until relieved by the further ingestion of food. The pain usually occurs from two to four hours after a meal. Thus, in duodenal ulcer, pain may be expected at about 12 o'clock in the morning, 4 o'clock in the afternoon, and 12 o'clock at night. Uncomplicated peptic ulcer is not accompanied by acute pain.

Medical management of gastric and duodenal ulcer is of four types:

1. The Sippy treatment. The hydrochloric acid is neutralized by frequent milk and cream feedings alternated with alkalis. The patient is kept in bed for three or four weeks.

2. The Alvarez treatment. Smooth foods are given between meals. No alkalis are administered. The patient is not confined to bed. He receives a glassful of a mixture of 1 qt. of milk, two eggs, and $\frac{1}{2}$ pt. of cream at 10 A.M. and 2, 4, 8, and 10 P.M.

3. The Smithies treatment. This is a "physiological rest" treatment which begins with rectal feedings and includes frequent feedings consisting principally of diluted carbohydrates.

4. The Jarotzky treatment. Alternate feedings of whites of eggs and fresh butter are given. The whites of eggs have the property of fixing the free hydrochloric acid and passing through the stomach quickly. The fresh butter suppresses gastric secretion and accelerates the emptying of the stomach.

In the surgery of gastric ulcer, the ulcer should be removed. For a gastric ulcer with a diameter of 1 cm. or less, local excision, preferably with the cau-

tery, is indicated. As a rule it is not necessary to remove a duodenal ulcer when performing a gastro-enterostomy, but when the duodenal ulcer is associated with hæmorrhage complete excision is indicated.

Peptic ulcers recurring after operation do not respond to medical treatment as well as primary ulcers. Consequently more patients with recurrent ulcer come to operation than patients with primary ulcers. When a recurrence of symptoms after gastro-enterostomy appears to be due to the re-activation of an old duodenal ulcer, it is probable that the opening is not well placed or is too small.

CHARLES F. DUBOIS, M.D.

Puig Sureda, J.: Late Results of Surgical Treatment of Gastroduodenal Ulcer (Resultados lejanos del tratamiento quirúrgico de la úlcera gastroduodenal). *Prog. de la clin.*, Madrid, 1931, xix, 289.

The author compares the late results of gastro-enterostomy for gastroduodenal ulcer with those of resection. He states that the surgical treatment of gastroduodenal ulcer is still empirical and the cause and pathogenesis of the disease are not known. The motility of the stomach is able to adapt itself to any conditions created by operation if there is no inflammation to interfere with free movement of the organ. The treatment of gastroduodenal ulcer has been based to a great extent on the theory that acidity is the cause of secondary ulcer and that extensive resection will prevent it. However, experience has shown that jejunal ulcer occurs and recurs frequently after extensive resection; that there may be hyperacidity after resection of the antrum and first portion of the duodenum; and that secondary ulcers may occur in cases of hypacidity without free acid.

The treatment of gastroduodenal ulcer should be directed, not against the acidity, but against the gastritis and duodenitis which produce and accompany it.

The future of patients operated upon for gastroduodenal ulcer depends to a great extent on the residual mucosa. Treatment for residual gastritis or duodenitis is frequently necessary after resection. In some cases the disease condition is limited to the ulcer, whereas in others the ulcer develops on the basis of a gastritis. In the former, surgical treatment, preferably gastro-enterostomy, is indicated. In the latter, medical treatment is to be preferred and surgery should be performed only as a last resort. Unfortunately it is difficult or impossible to differentiate between the two groups.

AUDREY G. MORGAN, M.D.

Blackford, J. M., and Baker, J. W.: Acute Perforating Peptic Ulcer. *Am. J. Surg.*, 1931, xii, 18.

This is a report of 21 cases of peptic ulcer operated on for acute perforation in a series of 445 cases in which a diagnosis of peptic ulcer was made. Two-thirds of the perforations occurred in patients between the ages of thirty-five and fifty years. Five

of the perforating lesions were gastric ulcers and 16 were duodenal ulcers. Eighteen of the perforations occurred on the anterior or superior surface of the duodenum and the anterior surface or lesser curvature of the stomach near the pylorus. Only 6 of 18 patients whose histories were obtained had had gastric disturbances immediately previous to the perforation. Twelve patients were relatively or absolutely free from symptoms at the time of the perforation.

The gross mortality was 15 per cent. Eighteen patients survived the operation. Of 4 who were treated by gastro-enterostomy and suture, 3 are now free from symptoms. Of 14 treated by simple suture of the perforation, 9 are free from symptoms, 2 are having symptoms severe enough to necessitate gastro-enterostomy, and 3 have been relieved by a secondary gastro-enterostomy. Of 8 examined recently with the X-ray, all present deformities.

Experimentally produced ulcers are grossly and microscopically similar to ulcers occurring in man. Hæmorrhages occur rather frequently. The bleeding usually comes from granulation tissue during a healing stage. The intestinal muscular coat destroyed by ulceration does not become repaired by new muscle fiber; a permanently thin spot persists in the bowel wall. During healing, the new mucous membrane grows over very delicate granulations. The thin, loosely attached mucosa may strip from the friable granulation base, and in the quiescent stage no painful yet protective inflammatory reaction is present. Hence a "blow-out" may occur through the peritoneum. This may explain the "silent perforations," "silent hæmorrhages," and the usual absence of a peritoneal reaction at the site of perforating peptic ulcers.

Acute perforations occur during severe and active symptoms of ulcer, but active erosion and inflammation boring through the wall of the viscus cause a protective localized peritonitis which prevents or seals acute perforation.

The findings and conclusions made by the authors in a review of 954 cases reported in the last ten years are summarized as follows:

1. Acute perforation of peptic ulcer occurs in 1 female to 21 males.
2. In the cases reviewed the gross surgical mortality was 22 per cent; the twelve-hour mortality, 15 per cent; the twelve to twenty-four hour mortality, 32 per cent; and the twenty-four hour mortality, 71 per cent. The causes of death were shock, general peritonitis, and late abscess complications.
3. Acute perforation of peptic ulcer almost never occurs in patients who have had treatment for peptic ulcer.
4. Massive hæmorrhage is rare at the time of acute perforation, but slight hæmatemesis is common.
5. Satisfactory results were obtained by simple closure in 66 per cent of 269 cases and by closure with primary gastro-enterostomy in 83 per cent of 42 cases.

6. The advocates of primary gastro-enterostomy, who perform this operation in one-half of their cases, report a gross mortality 4 per cent lower and satisfactory late results in 17 per cent more cases than the advocates of simple suture, who perform primary gastro-enterostomy in only 9 per cent of their cases.

7. Primary gastro-enterostomy is advisable when the patient is a reasonably good surgical risk.

NORMAN G. PARRY, M.D.

Hautefort, M. L.: Interrupted Anæsthesia in Gastric Surgery (*L'anesthésie interrompue en chirurgie gastrique*). *Bull. et mém. Soc. d. chirurgiens de Par.*, 1931, xxvi, 162.

The author recommends that in the performance of a gastrectomy or gastro-enterostomy rebreathing mixtures be used while the viscera are being handled. He points out that a patient once fully anesthetized can be maintained for from three-fourths of an hour to an hour on such mixtures plus a little oxygen. After the operation he gives glucose intravenously to aid in the elimination of the anæsthetic.

WILLIAM P. VAN WAGENEN, M.D.

Tartagli, D.: The Shape of the Duodenum from the Roentgenological-Anatomical Aspect (*La morfologia duodenale sotto il rispetto anatomico-radiologico*). *Radiol. med.*, 1931, xviii, 289.

Tartagli made a roentgen study of the duodenum of forty persons unselected as to age, sex, or type to determine whether or not there is a relation between the shape of the duodenum and the habitus similar to the relation between the shape of the stomach and the habitus. After describing the classical roentgen findings in a normal duodenum, he calls attention to two important measurements. One of the latter is the bulbar angle formed by the intersection of a line drawn perpendicularly from the base of the bulb toward the apex and a line drawn from one extremity of the base to the apex. This angle is an index of the general form of the bulb. The other is the angle of inclination of the bulb, which is formed by a line drawn perpendicularly through the midline of the spinal column and a line drawn through the center of the length of the bulb. This angle is taken as an index of the inclination of the axis of the bulb in relation to the spinal column.

The author concludes from his study that the most typical configuration of the duodenal bulb as seen with the X-ray is triangular. This form is not dependent upon the habitus, but seems to be related to the effect of ligamentous attachments to the bulb and to the form and position of the stomach. Deviations from it are probably due to changes in the tonus of the bulbar musculature or to pressure defects caused by adjacent organs.

The bulbar angle which is an index of the form of the bulbar triangle varies with the habitus in the same way as the stomach.

The angle of inclination of the bulb varies with the habitus and in the erect and prone positions. It

is influenced also by changes in the position of the stomach.

The length of the bulb, measured from the apex to the base, is usually 3.5 cm., but may vary in the same person during successive examinations and during the course of the same examination.

The normal position of the bulb, irrespective of the habitus, is to the right of the midline. In only a few of the subjects examined, those in whom the stomach was of the accentuated forms of Reeder, was the duodenal bulb found to the left of the midline.

The level of the bulb, although usually that of the third lumbar vertebra, is related to the habitus. In the stenotype individual it may be as low as the fifth lumbar vertebra, and in the platytype as high as the first lumbar vertebra, whereas in the mediotype, it is usually between the levels of the first and third lumbar vertebrae.

The form of the duodenal curve is related to the habitus, but shows slight variation with changes in the position of the subject. In the stenotype individual the semicircular form is occasionally encountered, but the duodenum of the "V" type is most common. In platytype persons, the duodenum usually has the shape of a "U."

Although the duodenum is considered immobile by anatomists, it possesses a motility of varying degree which is related to the habitus. In the stenotype person, it may move the distance of three lumbar vertebrae. It possesses not only this extrinsic motility in relation to fixed points, but also an intrinsic motility which is manifested by a change in form of the duodenal curve with changes in the position of the subject. The change in contour is due usually to changes in the shape of the third and fourth portions of the duodenum. The second portion of the duodenum possesses very little intrinsic mobility. The duodenojejunal angle at the ligament of Treitz rarely changes its position.

Following a discussion of the size of the bulb and the possible factors concerned in its variations, the author reviews the common anomalies of the duodenum and the defects in the duodenal bulb which may result from the pressure of adjacent organs or a change in position of the subject.

PETER A. ROSI, M.D.

Gallart y Mones, F.: The Pathogenesis of Megacolon (Contribución a la patogenia del megacolon). *Prog. de la clin.*, Madrid, 1931, xix, 306.

Twelve cases of megacolon are reported with photomicrographs and roentgenograms. The author believes that some of the current theories with regard to the pathogenesis of this condition are incorrect. According to the textbooks, megacolon is characterized by stubborn constipation with considerable dilatation of the abdomen and a chronic course, but in four of the author's cases the chief sign was diarrhoea, and in one case the condition was not chronic as it developed within a period of a few months. According to the classical description also,

megacolon is associated with elongation and dilatation of part or all of the bowel and hypertrophy of the bowel walls, but in one of the author's cases of extreme megacolon histological examination showed considerable atrophy of the bowel wall. The old theory that megacolon is always congenital was disproved by one of the author's cases in which the condition was very evidently acquired and five of his cases in which it was very probably acquired. In none of these cases were there associated congenital lesions. In all, the family history was negative for syphilis and the Wassermann test was negative.

Megacolon generally involves the distal part of the colon. There is never an organic stenosis. The dilated part is distinctly demarcated from the normal part. In a normal person or a person with organic stenosis, the injection of pituitrin generally causes intense contraction of the colon, but in a person with megacolon it results in only a slight contraction or none. The author therefore concludes that megacolon is a segmental change in the colon in which the hypertrophied or atrophied muscle coat loses its tonicity because of a lesion in the intestinal wall or in the intrinsic or extrinsic nerves which stimulate the wall, or because of absence of the normal endocrine or chemical stimuli of the centers which innervate it.

AUDREY G. MORGAN, M.D.

Roessle, R.: The Pathology of the Motor Apparatus of the Appendix (Beitrag zur Kenntnis der Pathologie der motorischen Apparate des Wurmfortsatzes). *Mitt. a. d. Grenzgeb. Med. u. Chir.*, 1930, xlii, 143.

The pathologico-anatomical theories regarding appendicitis were formerly based chiefly upon the pathology of the mucous membrane because there is more evidence indicating that the bacteria enter the appendix by way of the appendiceal lumen than that they reach it by way of the blood stream.

Roessle believes that disturbances in the motor function of the appendix are of great importance in the pathogenesis and symptoms of appendicitis as such disturbances lead to inadequate evacuation, retention, and decomposition of the appendiceal contents and thereby provide a basis for inflammation and auto-intoxication. In experiments on the appendices of cadavers and appendices removed at operation, he found that the human appendix is capable of muscular contraction causing expulsion of its contents. Histological study of the muscle and nerve supply was particularly informative.

In spite of our still imperfect knowledge, abnormality of the muscular layers may often be recognized with certainty. Thinning of the musculature is most marked in old obliterations and therefore is to be interpreted as an atrophy of disuse. The fact that the musculature is never found to be hypertrophic in the vicinity of fecaliths suggests primary insufficiency of the expulsive power. Thickening of the muscular wall is undoubtedly hypertrophy caused by work. It may occur even in the absence of obstruction, purely on the basis of frequently

repeated cramps. This fact suggests that appendices which are free from the danger of coprostasis because of their powerful musculature may cause symptoms because of cramps.

In addition to the well-known inflammations, appendices may produce symptoms also by changes in their nervous apparatus. The chief nerve changes are central neuromata in obliterated appendices, which occur only between the ages of fifteen and fifty years, and proliferations of the fibers and cells of nerve substance in the mucosa. These forms of disease are due to the type of nervous system in the mucous membrane of the appendix which possesses more sensory components. Disease of the nervous system serving motor function is manifested by hypertrophy of nervous and muscular strands coursing in the submucosa.

The question as to how closely the histological findings correspond to diminished motility (coprostasis) or increased motility (colics) of the appendix must be studied further. It was not possible to produce retention of contents and secondary inflammation in the healthy appendix of the dog. The absence of inflammation, even in adherent and kinked appendices, is due less to the position and form of the appendix than to auto-evacuation by unimpaired function of the neuromuscular apparatus. DREVEG (Z).

Elchoff, E., and Pfannenstiel, W.: *Experimental Studies on the Etiology of Appendicitis* (Experimentelle Untersuchungen zur Aetiologie der Appendicitis). *Beitr. z. klin. Chir.*, 1930, cli, 171.

Following an epidemic of appendicitis in Minden, in which three different types of bacteria were found—gram-positive anaerobic bacilli, colon bacilli, and diplococci or streptococci—a large number of freshly and chronically infected human appendices were studied bacteriologically. The findings were essentially the same. More detailed identification revealed the anaerobes to be Fraenkel's gas bacilli. Among the colon bacteria the lactic acid fermenting group was found to predominate. The diplococci and streptococci were recognized as modified enterococci which, in the probably strongly acid medium of the acutely inflamed appendix, had come to resemble pyogenic streptococci. True pyogenic streptococci and pneumococci were not found in acutely inflamed human appendices.

Since it could not be determined from bacteriological study alone which of the three types of organisms were the incitors of the inflammation, experiments on rabbits were performed. The authors attempted to answer three questions thereby:

1. Can a disease similar to human appendicitis be produced in the rabbit?

2. How does the primary affection begin?

3. What organism is particularly responsible?

When the various types of bacteria were injected into artificially stenosed appendices it was found, that only with the aid of the Fraenkel gas bacillus could a fatally terminating disease process be in-

duced. This suggested that the toxin-forming capacity of the anaerobes (which are also found in the normal human appendix) was increased by improvement in the anaerobic growth conditions resulting from symbiosis of the anaerobes with oxygen-consuming aerobes in the closed cavity of the obstructed appendix. The introduction of even large numbers of other bacteria cultured from human appendices resulted in no inflammation in either the stenosed or the non-stenosed appendix. In the non-stenosed appendix even the gas bacilli failed to produce inflammation.

However, as a syndrome resembling human appendicitis was sometimes reproduced by stenosis of the appendix alone without the injection of bacteria, no importance was attributed to the aforementioned three types of bacteria in the production of the experimental appendicitis. A combination of mechanical and bacteriological factors was assumed. The authors believe that in the completely closed appendix the primary condition is due less to fermentation products than to certain forms of necrosis and pus-producing organisms or their toxins, and that therefore gross mechanical insult is of no importance in the artificial production of appendicitis in rabbits.

Further studies were made of the therapeutic effect of gas-bacillus serum on the intra-appendiceal infection of rabbits. The results indicated that, when the infection is produced by a homologous strain, the antitoxic gas-gangrene serum does not prevent the disease, but, by neutralizing the gas-bacillus toxin, it increases the defensive powers of the peritoneum. HELNER (Z).

Cazzamali, P.: *Difficulties in the Diagnosis in Appendicitis* (Oscurità diagnostiche in tema di appendicite). *Clin. chir.*, 1931, vii, 113.

In his discussion of the difficulties encountered in the diagnosis of lesions of the appendix, Cazzamali presents detailed case reports illustrating the common errors and discusses herniation of the appendix into hernial sacs of various types.

Although the appendix is usually located in the right iliac fossa, it is sometimes found in the pelvis, subhepatic region, or the left side of the abdomen. Anomalous positions are important factors rendering the diagnosis of appendicitis difficult.

Even the normally located appendix may give rise to symptoms referable to other organs. The multiple vague symptoms referred to the stomach, appropriately designated by Languet as "appendiceal dyspepsia," resist medical treatment, but cease after appendectomy. Peptic ulcers are not uncommonly associated with inflammation of the appendix. The author accepts the embolic theory of Payer, who believes that the appendiceal inflammation gives rise to thrombosis of the veins of the meso-appendix and the omentum, and that the thrombi become dislodged and carried by way of the portal system to the gastric mucosa, where they produce small infarcts followed by necrosis and

ulceration. Besides treatment of the ulcer in these cases, appendectomy is necessary for complete relief of the symptoms.

Cazzamali discusses the changes in the liver that result from lesions of the appendix. The hepatic changes may be a cloudy swelling, cholangitis, or an intrahepatic abscess, all of which are probably due to extension of the infection from the appendix through the lymphatics or the portal system of the liver or to a toxemia with its focus in the appendix.

The toxemia may also produce changes in the kidneys with the appearance of albuminuria and hæmaturia during the course of the appendicitis.

To illustrate the difficulties and errors encountered in the diagnosis of appendicitis, the author presents the detailed clinical history and the operative and pathological findings in a case of appendiceal abscess that was mistaken for a neoplasm, a case of subhepatic appendiceal abscess that was diagnosed as calculous cholecystitis, a case of rupture of the gall bladder that was believed to be an appendiceal abscess, unusual cases of appendicitis on the left side, unusual cases of subacute and chronic appendicitis, a complicated case of acute inflammation of a retrocæcal appendix, and a case in which a renal stone simulated chronic appendicitis.

In a review of 6,941 cases of hernia, Cazzamali found 42 cases in which the appendix was located in the hernial sac. The ages of the patients ranged from nine to seventy-five years. The majority of the patients were males. The appendix was found most frequently in right inguinal hernia, but in 2 cases it was in a crural hernia and in 1 case in an inguinal hernia on the left side. The author cites from the literature cases in which umbilical, diaphragmatic, and left crural hernia contained the appendix.

The condition of the appendix in the hernial sac varied from normal to simple acute appendicitis, acute appendicitis complicated by abscess, chronic appendicitis, and strangulation of the appendix at the neck of the hernial sac which was either primary or secondary to an inflammatory swelling of the appendix. In 8 cases the appendix was normal; in 22 cases it was acutely inflamed and simulated a strangulated inguinal hernia; and in 12 cases it was adherent to the sac.

Since very few of the appendices found in hernia are free from evidence of chronic inflammation, the author recommends the removal of all appendices found in hernia. Some surgeons advise against appendectomy during the course of a herniotomy because of the danger of contaminating the wound, but Cazzamali has found that soiling of the wound can be prevented as he has had no instance of wound infection in his cases. PETER A. ROSE, M.D.

Jennings, J. E.: The Relation of the Welch Bacillus to Appendicitis and Its Complications. *Ann. Surg.*, 1931, xciii, 828.

In the study reported in this article anaerobic cultures were made of the contents of appendices,

tissue taken from the wall of the appendix without invading the lumen, fluid removed from cases of peritonitis following gangrenous appendicitis, and the blood of patients with proved bacillus welchii peritonitis. Most of the cultures of blood were negative. The results of the other cultures suggested that the bacillus welchii is present in the lumina of most appendices and is frequently found outside of the gut in an actively growing form in appendiceal abscess, localized peritonitis, and free peritoneal exudate; that while in most cases its activity is cut short by operation with removal of the appendix, this is not always true and the micro-organism is an active factor, if not the most active factor, in the production of a fatal disease.

At first, the presence of bacillus welchii infection was determined by cultures and animal tests, but as experience was gained, more dependence was placed upon the clinical appearance of the peritoneal exudate and the examination of smears made at the operating table. In diffuse peritonitis due to the bacillus welchii the temperature is not greatly elevated, but the pulse is fast. The mucous membranes are cyanotic, the pupils are dilated, and the face shows a dusky flush.

In the first cases treated with antitoxin the antitoxin was given intravenously at the time of operation. As this often provoked a severe reaction, the antitoxin is now given subcutaneously with normal salt solution. When the presence of the bacillus welchii is proved by culture, the antitoxin is given daily for two or three days. The number of times it must be repeated is determined from the symptoms and the course of the disease.

The author reports in detail five cases of gangrenous appendicitis with general peritonitis following rupture of the appendix, in all of which treatment with the antitoxin was followed by marked improvement. Four of the patients recovered. The one patient who died had been ill for twelve days before he came to operation.

WILLIAM J. PICKETT, M.D.

De Almeida Prado, A., and Montenegro, J.: Chronic Appendicitis and Mesosigmoiditis of Tuberculous Origin (Appendicite chronique et mésentéro-méridite d'origine tuberculeuse). *Rev. Sud.-Am. de méd. et de chir.*, 1931, ii, 21.

The authors report a case of tuberculous mesosigmoiditis in a boy eighteen years of age who gave a history of crises of periumbilical pain accompanied by severe constipation with interval attacks of mucosanguineous diarrhoea lasting from one to three days and ceasing spontaneously. Except during these crises, the patient enjoyed good health and was able to work. Following a slight fall, the pain became constant and more generalized throughout the abdomen and during deep breathing there was a sensation suggesting a mass pressing upon the stomach. There was no diarrhoea, melæna, or hæmatemesis, but a slight ephemeral fever was noted.

The findings of physical examination were negative except that abdominal palpation revealed an indefinite tense epigastric swelling which extended toward the left hypochondrium. Percussion of this swelling caused sharp pain. There was a sensation of fixation of the transverse and descending colon. The twenty-four-hour opaque meal showed dilatation of the cæcum, a retrocecal vacuolated appendix, and gunbarrel deformity of the sigmoid. These findings suggested chronic appendicitis or chronic intestinal obstruction with mesosigmoiditis. The gunbarrel formation in the sigmoid in conjunction with the history led to a diagnosis of mesosigmoiditis.

Laparotomy confirmed the pre-operative diagnosis. The mesosigmoid showed recent star-like cicatrices. Pathological examination of the appendix, mesoappendix, and a portion of the mesosigmoid showed chronic interstitial appendicitis with typical tubercles in the submucosa and mesoappendix and a cicatricial mesosigmoiditis without tubercles. The patient recovered.

After relief for a time, the trouble recurred and further roentgenological studies showed an organic lesion with infiltration of the walls of the first portion of the sigmoid. As the patient was greatly emaciated, he was given medical treatment to prepare him for another operation.

The authors believe that there was a causal relationship between the appendicitis and the mesosigmoiditis. Although tubercles could not be demonstrated in the mesosigmoid, it seemed illogical to them to search for another etiological factor when both conditions could be attributed to the same histological process.

JAMES B. MASON, M.D.

Sheaf, E. W.: *The Treatment of Acute Appendicitis by Crile's Method.* *Guy's Hosp. Rep.*, Lond., 1931, lxxxi, 229.

The author reports on 394 cases of acute appendicitis which were operated upon. There were 4 deaths in 57 of the cases which were complicated by diffuse peritonitis, 4 deaths in 65 cases of abscess formation, and 1 death in the remaining 272 cases which were uncomplicated.

As soon as the diagnosis was made, $\frac{1}{6}$ or $\frac{1}{4}$ gr. of morphine was given, and arrangements were made for operation as soon as possible. All cases were operated on irrespective of the length of history, and operation was never refused on the ground that the patient was too ill. The anæsthetic of choice was nitrous oxide and oxygen, but in most cases ether was used as nitrous oxide and oxygen were not available. The abdominal wall was usually, but not always, infiltrated with 0.5 per cent novocain down to the peritoneum. McBurney's gridiron incision was used as a rule and a paramedian incision occasionally. Except in certain cases with abscess, the appendix was removed with minimal disturbance. If the appendix was unperforated the wound was usually closed without drainage.

The presence of free turbid fluid was not looked on as an indication for drainage unless the appendix was perforated, the infection being thought probably due to the harmless, or even protective, invasion of staphylococcus albus. When an abscess was found it was opened, if possible, without opening the peritoneal cavity and as laterally as possible. If opening of the abscess made it necessary to go through the healthy peritoneal cavity, the latter was packed off with moist gauze. When the abscess had been opened the pus was gently mopped out. The appendix was then removed only if this could be done without disturbing protective adhesions. In about half a dozen cases the cavity was freely mopped out with the mercurochrome solution used for sterilizing the skin (mercurochrome, 2 gm.; water, 35 c.cm.; alcohol 95 per cent, 55 c.cm.; acetone, 10 c.cm.). The patients so treated progressed well and seemed to heal more quickly than the others. The wound was closed around a drainage tube.

If healthy peritoneum had not been opened no special after-treatment was given, but if it had been opened, treatment as for peritonitis was employed until the danger was over. If the appendix had not been removed, the appendectomy was done as soon as the wound was soundly healed. The cases in which frank pus was found and those in which there were no limiting adhesions were classified as cases of spreading peritonitis. The appendix was removed with minimal disturbance, and the wound closed around a drainage tube with the use of as few stitches as possible and care to prevent interference with the blood supply.

In the after-treatment large hot fomentations were applied in most cases. Fluid was given chiefly by rectum. The patient was kept in Fowler's position and given $\frac{1}{6}$ gr. of morphine every four hours as long as this was required to keep him comfortable. Enemata and pituitrin were absolutely forbidden. No stimulants were administered.

Under such treatment, the temperature and pulse rate usually fell, abdominal tenderness subsided, and after about thirty-six hours flatus began to pass. When this stage was reached, feeding by mouth was started, the proctoclysis and morphine were stopped, and the drainage tube was shortened. If vomiting occurred the stomach was emptied by aspiration.

Sometimes at the end of forty-eight hours or a little longer, flatus has not been passed and distention appears. For this condition there are 3 possible explanations:

1. The peritonitis may have subsided and the bowel may be unable to empty simply because it is so full that its ordinary peristalsis is not able to make a start and attempts to contract the abdominal muscles are painful. In such cases a turpentine enema or a dose of eserine may be all that is required.

2. The peritonitis may not have subsided. Under such circumstances it is advisable to wait a little

longer, keeping the stomach empty, or, if the condition seems sufficiently urgent, perform an enterostomy.

3. There may be mechanical obstruction from a band, a kink held by adhesions, or the pressure of a residual abscess, which will, of course, require operation.

None of the patients whose cases are reviewed required operation for obstruction, and only 1, who died in spite of it, had an enterostomy. A few had a residual abscess in the pelvis. Drainage of the pelvis does not prevent the formation of these abscesses. In the cases reviewed, the abscesses occurred after drainage of the pelvis.

The mortality in the cases reviewed was 2.28 per cent.

MANUEL E. LICHTENSTEIN, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Fedorov, S.: Contributions to Biliary Tract Surgery, Based on 515 Operations (Einige Beiträge zur Gallenwegchirurgie auf Grund von 515 Operationen) *Nor. chir. Arch.*, 1930, **xx**, 163.

Up to the end of the year 1929, 515 cases of different diseases of the biliary tract were operated upon at the Military-Medical Clinic at Leningrad. There were 25 cases of malignant neoplasm (about 5 per cent), and 490 cases of cholecystitis with and without stones. There were 5 times as many female patients as male patients. The total mortality was 10 per cent (40 deaths). In the last 228 operations, however, the mortality was only 5 per cent (12 deaths).

The most important causes of death were post-operative hemorrhage (15 times), peritonitis and angiocholitis (7 times each), pneumonia, and cardiac insufficiency. If the cases of cholemia, angiocholitis and biliary fistulae are excluded, the mortality was between 2 and 3 per cent. Of 34 patients who were operated upon in the acute or subacute stage, 12 died. Therefore the author does not advocate operation in acute cholecystitis. He believes the danger of perforation of the gall bladder is exaggerated.

With regard to errors in the diagnosis of cholecystitis, the author says that various diseases of the stomach and duodenum and, less often, diseases of the appendix and kidneys, are mistaken for this condition. Neuroses of the abdominal cavity and Aschoff's stasis of the gall bladder also present great diagnostic difficulties. In hydrops of the gall bladder a calculous obstruction is usually found.

In cholelithiasis, cholecystectomy appears to be the best operation. In cases in which the cystic duct is constricted, the common bile duct is undilated, and large stones are present, cholecystectomy may be sufficient, but otherwise choledochotomy is indicated. There should be no hesitancy in using a bougie on a constricted papilla of Vater, but if the papilla cannot be dilated, choledochoduodenostomy is indicated.

Operations on cholemic and acholic patients often give rise to profuse and fatal hemorrhages. All of the remedies recommended for the control of these hemorrhages to date are sometimes futile. The best prophylactic procedure appears to be pre-operative blood transfusion. These hemorrhages may occur even in cases in which the coagulability of the blood is normal or above normal. Their cause lies in hepatic dysfunction or hypofunction and the absence of bile from the intestinal tract. It is most important that the bile be diverted into the intestine as soon as possible, and sometimes cholecystenterostomy may serve the purpose excellently. Therefore, in the cases of cholemic patients the operation should never be begun with a cholecystectomy.

Cholecystectomy should also be avoided in cases of external biliary fistula. Occasionally such a fistula can be extirpated from the abdominal wall and implanted into the stomach or the duodenum. Sometimes an extra-abdominal anastomosis of an external fistula with the intestine by means of a rubber tube may be of value. The author has observed patients with such an anastomosis who were able to lead almost a normal life for a long time (up to five years).

In most of the cases reviewed, the cholecystectomy was subserous and was begun at the neck of the gall bladder. Sometimes the surgeon must be satisfied with incision, thermocauterization, and closure of the gall bladder. It is generally agreed that the abdominal wound should be closed after the operation. If complete hemostasis has been obtained and the operative field is well covered with peritoneum, complete primary closure is possible even in infected cases. If packing is indicated, the packing must be wide. Drainage tubes and narrow gauze strips should not be used. Besides quicker wound healing, complete closure of the abdominal cavity favors a smooth postoperative course without pain and meteorism and with a good general condition. Kehr's drainage should not be forgotten as occasionally it may be used to great advantage.

G. ALROV (Z).

Kirklin, B. R.: The Necessity for Accurate Technique in Oral Cholecystography: Errors Attributable to Technical Lapses. *Am. J. Roentgenol.*, 1931, **xxv**, 595.

Of the 2 methods of cholecystography, the method in which the opaque dye is administered orally is used far more extensively than the method in which the opaque dye is given intravenously, yet it is widely assumed, and many adherents of the former procedure have been disposed to grant without argument, that the oral method is considerably less accurate than the intravenous method. Kirklin is convinced that this assumption had its origin chiefly in the experimental period of cholecystography, when methods in which the dye was given by mouth were diverse and very imperfect; that a statistical comparison of the 2 methods often has

been made under conditions which were not validly comparable; and that if a rational and punctilious technique is employed, the diagnostic results following the oral administration of the dye are fully as reliable as those obtained when the dye is given intravenously. Experience has shown that when the drug is given by mouth the following conditions should be met:

1. The dye should be administered in sufficient quantity and in a freely absorbable form.
2. It should be so given that it will not tend to excite nausea, vomiting, or annoying catharsis.
3. It should be taken into the stomach immediately after the ingestion of a full meal containing a minimal quantity of fats.
4. Fats should be withheld subsequently until the gall bladder has had an opportunity to fill with dye-laden bile and to concentrate it.
5. As a routine, roentgenograms should be made at not less than 3 properly spaced intervals.
6. A fatty meal should be given between the final sets of roentgenograms.

7. Other food or drink that might empty the gall bladder prematurely should be withheld.

8. Purgatives and other medicaments that may affect the motility or absorbability of the bowel or the function of the gall bladder must be interdicted during the period of examination.

The routine procedure now satisfactorily employed at the Mayo Clinic represents an effort to fulfill these requirements, but attained its present form only after a long period of trial and error. As in many other roentgen laboratories, various cholecystographic media have been tested, but none has been found superior to the sodium salt of tetraiodophenolphthalein. The latter is dispensed to the patient in a uniform dose of 4 gm., freshly dissolved in 30 c.cm. of distilled water. The patient is instructed to mix the solution with a glassful of grape juice, orange juice, or carbonated mineral water, and to drink the mixture immediately after finishing the evening meal. When the mixture is taken as directed, it is palatable to most persons, readily absorbed by the bowel, and seldom followed by nausea, vomiting, or troublesome catharsis. The author emphasizes, however, that the meal must be of substantial amount, reasonably free from fats, and followed at once by the cholecystographic compound.

Kirklin is of the opinion, although he lacks proof, that castor oil and perhaps other purgatives taken within twenty-four hours prior to the test may vitiate the results.

A careful roentgenographic technique is essential for correct diagnosis. This is true whether the drug is given orally or intravenously. Prevention of bodily movement is also of prime importance as the slightest displacement of the gall bladder during roentgenography may obliterate evidences of stones or papillomata. In the laboratory at the Mayo Clinic such movement has been reduced to the minimum by employing a high milliamperage and

a short time of exposure, immobilizing the patient with a broad canvas band drawn tightly over his back, and requiring the patient to exhale deeply and then cease breathing during the exposure.

Since the advent of cholecystography, more than 35,000 patients have been examined at the Mayo Clinic after oral administration of the dye. The diagnostic results, although excellent from the beginning, have been improved by scrupulous attention to the technical features which Kirklin has emphasized. Taking account of all errors, both positive and negative, the average incidence of correct diagnosis is now slightly above 90 per cent, which is virtually identical with the average reported by those who administer the dye intravenously.

The technique described by Kirklin has little claim to novelty, but is presented in detail because it has proved to be thoroughly satisfactory.

Fleming, B. L.: An Investigation of the Functions and Symptoms of the Surgically Drained Gall Bladder. *Ann. Surg.*, 1931, xciii, 730.

Thirty-six patients were studied by cholecystography following cholecystostomy. Twenty-seven were women. The average time since the cholecystostomy was forty-six months; the longest time, two hundred and thirty months; and the shortest time, six months. One patient (2.7 per cent) gave a normal response. Thirty-five patients (97.3 per cent) showed absence or impairment of function.

Three of seven visualized gall bladders showed normal emptying function.

Eighteen patients (50 per cent) were free from symptoms although their cholecystograms indicated impairment of gall-bladder function. In the cases of fourteen of this group the gall bladder was not visualized.

Three patients had a recurrence of symptoms severe enough to necessitate cholecystectomy. In two, tones were left in the gall bladder at the first operation.

Eighteen (50 per cent) were free from symptoms, and fourteen (39 per cent) had been definitely benefited by the cholecystostomy.

The examination revealed gall stones in thirty-two patients, empyema of the gall bladder in seven, and common duct stones in six. Gall stones were found in all cases of empyema and all cases of stone in the common duct. One patient had gall stones, empyema of the gall bladder, and stones in the common duct.

From these findings the author draws the following conclusions:

1. Cholecystography, being a test of function, is of no assistance in the evaluation of symptoms arising subsequent to cholecystostomy.

2. External surgical drainage of a diseased gall bladder is not a means of restoring normal gall-bladder function.

3. Normal function of the surgically drained gall bladder is not essential to good health.

4. The surgically drained gall bladder that fails to cause symptoms subsequently represents a healed-in lesion.
L. ENWORTH BOVIX, M.D.

Vallone, D.: Anatomical and Bacteriological Changes in the Biliary Tract After Experimental Cholecysto-Entero-Anastomoses (Le modificazioni anatomiche e batteriologiche delle vie biliari dopo le colecisto-entero-anastomosi sperimentali). *Ann. ital. di chir.*, 1913, x, 138.

In experiments on dogs, anastomoses were made between the gall bladder and the stomach, duodenum, small intestine, and transverse colon. The common duct was then sectioned. The common duct was sectioned instead of ligated in order to prevent re-establishment of its permeability. After each anastomosis the biliary tract was studied roentgenologically by introducing an opaque medium through the anastomosis. The roentgenograms are reproduced. The liver parenchyma was studied histologically.

The author found that anastomosis between the gall bladder and the stomach or intestine inevitably leads to ascending infection of the biliary tract. Low cholecystenterostomy is incompatible with life. The degree of infection of the biliary tract is directly proportional to the size of the opening. The lower in the intestinal tract the anastomosis the more severe the infection. After anastomosis of the gall bladder to the stomach, the dogs survived four or five months, while after anastomosis of the gall bladder to the lower part of the intestine they survived only a few days and abscesses developed in the liver.

The anastomosis is followed by dilatation of the intrahepatic and extrahepatic bile ducts. The dilatation is not caused by an increase of the pressure in the ducts as this pressure may even decrease because of lack of action of Oddi's sphincter. It is due directly to the ascending infection and varies with the severity of the latter. Among the bacteria most frequently found in infection of the biliary tract after anastomosis of the gall bladder to the intestine are staphylococci and colon bacilli.

AUDREY G. MORGAN, M.D.

Perrotti, G.: The Effects of Interrupting Pancreatic Excretion by Detaching the Pancreas from the Duodenum (Gli effetti della interruzione delle vie escretrici pancreatiche mediante la dissezione del pancreas dal duodeno). *Ann. ital. di chir.*, 1931, x, 145.

Perrotti reports experiments carried out on dogs in which he detached the pancreas from the duodenum, thereby completely and permanently interrupting the excretion of both the internal and external pancreatic secretions. The operation was followed by regressive changes throughout the parenchyma of the gland which led to gradual disappearance of both the acinous and the insular part. The acinous part was destroyed much sooner than the insular part. After considerable degenera-

tion of the insular part had occurred the animals developed severe pancreatic diabetes. As both parts of the gland are destroyed, it is impossible in this way to obtain gland tissue deprived entirely of external secretion and suitable for grafting without severely injuring the insular part of the gland.

AUDREY G. MORGAN, M.D.

Phillips, A. W.: Hypoglycæmia Associated with Hypertrophy of the Islands of Langerhans. *J. Am. M. Ass.*, 1931, xcvi, 1195.

Most authorities agree that the normal blood sugar limits are between 80 and 120 mgm. per 100 c.c.m. of blood. Persons exhibiting symptoms of hypoglycæmia usually have readings below 70 mgm. A hypoglycæmic syndrome may include fatigue, anxiety, irritability, lassitude, gnawing hunger, twitching of the muscles, tremors, phenomena simulating drunkenness, diplopia, vasomotor changes, hot flashes, secretory irregularities, lachrymation, profuse perspiration, vertigo, syncope, loss of emotional control, convulsions, and coma.

Hypoglycæmia is produced by alkalosis and hypocalcæmia. It follows the injection of insulin, albumose, and peptone, and may follow extensive burns. It is present in certain disturbances of the liver and in certain disturbances of the thyroid, pituitary, and suprarenal glands. The blood sugar is low also after muscular exhaustion and in progressive muscular dystrophy. The literature records a few cases in which hypertrophy, adenoma, or carcinoma of the islands of Langerhans was associated with a low blood sugar.

The author reports a case of uræmia with hypoglycæmia. The urea nitrogen in the blood was 203 mgm. and the blood sugar ranged from 45 to 25 mgm. The autopsy findings indicated that the precipitating cause of death was of nephritic origin. The islands of Langerhans were large, averaging 328 to 242 micra, whereas their normal average size is about 157 by 146 micra. As no other cause of the hypoglycæmia could be found, it is presumed that the enlarged islands were responsible. Cecil and others have noted large islands in cases of diabetes.

EARL O. LATIMER, M.D.

Bodart, A.: Methods of Production and Development of Pancreatic Fistulæ (Modes de production et évolution des fistules pancréatiques). *Arch. franco-belges de chir.*, 1929-30, xxxii, 545.

Pancreatic fistulæ are formed after very diverse operations performed on the pancreas or one of the nearby organs. From the etiological or pathogenic point of view, it is necessary to consider three factors: (1) the presence of a continuous epithelium lining the fistula, (2) the opening of an important excretory canal in the wall, and (3) more or less marked destruction of the glandular parenchyma. Therefore, according to the causes, fistulæ may be classified into three groups:

Group 1. Fistulæ with a continuous epithelium, principally chronic fistulæ.

Group 2. Fistula associated with an open duct of Wirsung. If the section is complete and if the derivation of fluid is nearly complete, the conditions are those of experimental fistula—fistulization of indefinite duration.

Group 3. Fistula communicating with a secretory parenchyma. The persistence of the secretion is dependent upon: (a) the opening into the tamponed cavity or into the cyst of a considerable number of gland lobules, and (b) persistence of the vitality of the acini, which depends upon intact vascularization and absence of extensive sclerosis.

When an incision is made for the removal of calculi a lateral wound of the duct of Wirsung is produced and the resulting fistula is not serious.

A lateral wound is made also when a retention cyst is opened, but under these circumstances the fistula will persist if the obstruction is permanent.

When a tumor is removed, fistulization may or may not occur. It is certain to occur, however, if the normal parenchyma is incised and if an important excretory canal is sectioned.

When an adherent or penetrating ulcer is torn or dissected, the resulting fistulization is generally not serious as the canals are usually not involved.

Difficult operative procedures at the level of the duodenal stump may be followed by a temporary fistula if a lateral wound is made in the duct of Wirsung or Santorini and by a permanent fistula if the duct of Wirsung or Santorini is completely sectioned.

In traumatic rupture or inflammatory destruction which is operated upon early before the stage of organization, section of the duct of Wirsung itself is exceptional. It is possible in contusions, but occurs seldom in pancreatitis, even pancreatitis of the dissecting type.

Destruction of the parenchyma is often severe, but is not a certain cause of serious fistulization. Everything depends on the vitality of the acini exposed in the fistula and the degree of the infectious or post-traumatic sclerosis which invades the acini. However, nothing in the etiology makes it possible to forecast the action of these two factors.

In traumatic or inflammatory destruction operated upon late, in the stage of organized pseudocyst, a false wall covers the bottom of the fistula. This wall may be completely sclerotic, excluding the cyst and therefore the fistula from the secretory elements. Under such circumstances, there is a fistula with ordinary fluid which is not serious. In other cases the wall may be largely sclerotic, but may contain a few active secretory elements. Under such circumstances the fluid is not very active and the fistula will probably be only temporary. In a third group of cases the wall may be covered with living and secreting acini. Under such circumstances the fluid is very active and the prognosis for healing of the fistula must be reserved.

Before operation, the sclerotic organization of the wall has a greater chance of being complete in inflammatory pseudocysts than in traumatic pseudo-

cysts, infection being one of the most important causes of sclerosis and devitalization of nearby acini.

After operation, a mild vasomotor or a purely inflammatory attack from re-activated or new infection may continue the process of organization and to a degree which cannot be determined in advance. Thus a traumatic pseudocyst operated upon early, which has only slightly sclerotic walls and a very active fluid and therefore all of the theoretical chances for prolonged fistulization, may become healed quickly because of postoperative changes.

If the epithelium of a true marsupialized cyst remains intact and if no new infectious process destroys it or permits union of the connecting walls, the fistula will persist for an indefinite period. PACE.

Carr, A. D., Parker, R., Grove, E., Fisher, A. O., and Larimore, J. W.: Hyperinsulinism from a B-Cell Adenoma of the Pancreas. *J. Am. M. Ass.*, 1931, xcvi, 1363.

It was not until recently that a hypoglycemic state was definitely proved to result from hyperplasia of the insulin-forming tissue.

Three cases of partial extirpation of the pancreatic tissue for hypoglycemia are on record. The authors report a fourth. The authors' patient, a boy nineteen years of age, had attacks of unconsciousness during which his behavior was abnormal. The attacks occurred almost daily. They began with a sense of hunger and anxiety followed by mental confusion, and progressed to a stupor associated with profuse perspiration, slight cyanosis, and muscular twitching. Recovery occurred spontaneously after a few hours. The patient was then tired and ravenously hungry. The drowsiness was promptly relieved by food. Candy was often used to abort an attack. During one attack the blood sugar was 44 mgm. per 100 c.cm.

The patient was placed on a diet rich in carbohydrates. During a period of eight months on this diet he had only mild symptoms, but became desirous of surgical treatment.

At operation, the pancreas appeared normal except for a firm bluish mass 2 cm. in diameter in its mid-portion. The latter was easily lifted out of the substance of the gland. No leakage of the pancreatic secretion occurred at the drainage site. Twenty-four hours after the operation the blood sugar rose to 107 mgm. per 100 c.cm. The glycosuria did not recur.

The specimen removed at operation was an encapsulated, firm, dark red mass the size of a small walnut, which consisted essentially of columns of epithelial cells in which were numerous modified Langerhans cells of the B type.

STANLEY H. MENTZER, M.D.

Lambert, G., and Bottin, J.: Two Cases of Tuberculosis of the Spleen (A propos de deux cas de tuberculose de la rate). *Rev. belge d. sc. m.d.*, 1931, iii, 35.

The authors report a case of scleronodular tuberculosis of the spleen in which the diagnosis was based

on a section from an accessory spleen and a case of miliary tuberculosis of the spleen in which the condition was believed to be Banti's disease before the pathological examination was made. Neither case presented the symptom triad of Rosengart—splenomegaly, hyperglobulia, and cyanosis. Careful and minute hematological studies gave no clue to the nature of the disorder.

In the authors' opinion, a pre-operative diagnosis of splenic tuberculosis is practically impossible except at a very late stage when the tuberculosis is generalized. The most important aid in the clinical diagnosis seems to be the history.

The authors contribute data on the spleen as a hematopoietic organ. In pathological sections they found splenoblasts of Haucke and two types of myeloblasts which they believe must have been formed in the spleen since none could be found in the general circulation. They noted also that the splenoblasts arose from splenic reticular cells and not from lymphocytes or lymphoblasts (Haucke). The spleen is a destroyer of erythrocytes. The authors believe that the abnormal erythrocytes are predisposed to splenic destruction and that this is why they are not seen in the general circulation. The spleen inhibits the production of platelets by the bone marrow.

Splenectomy is followed first by a decrease in the number of erythrocytes and the hemoglobin, a polynucleosis with absence of eosinophiles, and an increase in the number of platelets. Later, the erythrocytes return to their original number and there is a mononucleosis with a persistently increased number of platelets.

The leucocytosis is an index of the reaction of the hematopoietic system in the absence of the spleen.

The exaggerated mononucleosis which is always present four months after the operation and follows an exaggerated transitory polynucleosis seems to be a sign of continuation of the affection. The latter is not localized in the spleen alone, but involves the entire hematopoietic system. The change in the leucocytic formula in the sense of a mononucleosis is perhaps an important premonitory sign of the opening of new organic lesions.

JAMES B. MASON, M.D.

MISCELLANEOUS

Clavel, C.: An Early Sign of Visceral Lesion in Contusions and Wounds of the Abdomen. The Sign of Peritoneal Fluttering (Sur un signe précoce viscéral dans les contusions et plaies de l'abdomen. Signe du treblotement péritonéal). *Presse méd.*, Par., 1931, xxxix, 509.

Within the first hour or half hour following an accident many of the classical signs of visceral lesions are still lacking and general symptoms are masked by shock. Tixier called attention to the fact that the presence of discrete ascites in chronic abdominal disease (ovarian tumor, fibroma, gastric neoplasm) is revealed by slight undulations of the abdominal wall on succussion or percussion, and

a peculiar sensation of floating of the uterus and slight distention of the pouch of Douglas perceived on vaginal palpation. Clavel has employed Tixier's method of examination in cases of abdominal contusion and wounds. Its use is possible only in the absence of contracture.

With the patient lying on his back with the thighs relaxed, the palmar surface of the four last fingers is placed flat in the iliac fossa and the abdominal wall is depressed several times in rapid succession. When fluid is present, the undulatory movement of the wall yields a double sensation, tactile and visual. The tactile sensation is not of waves properly speaking, but a sort of gelatinous trembling doubtless due to perception of the intestinal loops which float in a little fluid and strike the fingers. The visual sensation consists of the transmission of the undulation to the wall of the opposite side, a sort of visual interpretation of clapotage. This sign, which Clavel calls "peritoneal fluttering," was noted in the absence of dullness. Sometimes it coincided with the perception by touch of a painful, if not distended, pouch of Douglas.

Clavel was able to establish the presence of the sign in several cases, five of which he reports. In the first case there was an abdominal contusion with intraperitoneal rupture of the left kidney involving the renal pedicle. The peritoneal fluttering preceded the appearance of contracture by about four hours, and if it had been interpreted as an indication for operation, the hemorrhage which necessitated transfusion would have been avoided. The sign was noted also in two cases of penetrating wounds of the abdomen due to revolver bullets and two cases of peritoneal inundation from tubal pregnancy.

In a case of thoraco-abdominal wound the presence of the sign permitted the early diagnosis of abdominal penetration. In the case of a young man wounded by several revolver bullets in the lower part of the thorax, the indication for operation was based on the presence of peritoneal fluttering and the probability of a lesion of an abdominal organ which was suggested by the orifice of entrance of the bullets. Operation revealed a gastric tear, a wound of the pedicle of the spleen, a fissure of the left lobe of the liver, and a large amount of blood in the abdominal cavity.

PAGE.

Delfor del Valle and Bidart Malbrán: Two Cases of Subphrenic Abscess (Consideraciones clínico-quirúrgicas sobre dos casos de abscesos subfrénicos). *Arch. argent. de enferm. d. apar. digest.*, 1931, vi, 385.

As the subphrenic space is divided into a number of separate chambers, subphrenic abscesses tend to be multiple. In from 30 to 35 per cent of cases, subphrenic abscess is caused by peritonitis following appendicitis, and in 20 per cent by peritonitis following gastric ulcer. The abscess may be formed by direct propagation, embolism on the convex surface of the liver resulting in a liver abscess which ruptures into the subdiaphragmatic space, intraperitoneal lymphatic propagation, or direct or lymphatic

retroperitoneal propagation. The last two mechanisms are found particularly in cases of subphrenic abscess caused by appendicitis.

The two cases of subphrenic abscess reported by the authors were those of patients forty-two and forty-one years of age. In both, the abscess was on the right side and occupied both the anterior and the posterior chambers. In the first case there was no doubt that the abscess originated from appendicitis. In the second case the patient had had peritonitis and was operated upon for appendicitis, but the findings at operation suggested that the cause of the symptoms was a perforated ulcer. Recovery resulted in two weeks. The subphrenic abscess developed on the right side eight months later. Roentgen examination then disclosed a lesion in the first part of the duodenum.

The mortality of operation for subphrenic abscess varies from 23 to 50 per cent. The authors attribute the recovery in their cases to the early drainage. In cases not operated upon the mortality is 75 per cent. In cases of double abscess, such as those

reported by the authors, both anterior and posterior drainage must be established. The chief problems in the surgical treatment are to determine which is the principal focus and whether the cavities communicate with each other or can be made to communicate so that one operation will be sufficient. Roentgenograms will show the presence of a subphrenic abscess and the side involved, but will not show whether the abscess is anterior or posterior or both.

In the authors' two cases operation was performed by the transpleural and transdiaphragmatic route. This is a very good route for operation on an anterior collection, but for cases in which exploration is necessary, Ochsner recommends a subperitoneal route through an incision paralleling the costal border and separation of the parietal peritoneum from the diaphragm for exploration of the upper surface of the liver. If this route proves unsatisfactory for drainage after the abscess has been found, the wound may be closed and another incision may be made.

AUDREY G. MORGAN, M.D.

GYNECOLOGY

UTERUS

Goldstine, M. T., and Fogelson, S. J.: The Treatment of "Irregular Uterine Hemorrhage" with the Female Sex Hormone. *Am. J. Obst. & Gynec.*, 1931, **xxi**, 464.

This report is based on thirty-three cases of irregular uterine hemorrhages in which careful examination revealed minor pelvic disease and the uterine scrapings ruled out all possibility of malignancy. An active hormone prepared according to Laqueur's specifications was used. When the bleeding was severe, an initial dose of about 100 mouse units was given. Whenever possible, 50 mouse units were injected intramuscularly every other day, beginning early in the intermenstrual period. The initial course varied from 10 to 15 injections, depending upon the response. The later treatment usually consisted of 6 injections begun after menstruation. The treatment was continued until a normal menstrual cycle was established, the menopause ensued, or negative results proved that the method was inadequate.

Thirteen of the twenty-five successfully treated patients were eased into the menopause. In the cases of the twelve others, the irregular uterine bleeding was changed into apparently normal menstruation for from two to six months. In two of the six cases in which the treatment failed, hysterectomy disclosed an undiagnosed submucous fibroid.

E. L. CORNELL, M.D.

Crainicianu, A., and Pavelescu, P.: Contribution to the Study of the Treatment of Uterine and Adnexal Inflammations by Regional Vaccination: the Basset-Poincloux Method (Contribution à l'étude du traitement des métrо-annexites par la vaccination régionale: méthode Basset-Poincloux). *Rev. franç. de gynéc. et d'obst.*, 1931, **xvii**, 1.

The authors report their results from regional vaccine therapy in inflammations of the uterus and adnexa. This treatment, advocated by Basset and Poincloux, consists of injections of specific vaccines into the tissues primarily involved which act as foci for the dissemination of the infection throughout the body. The authors believe it may be applied extensively in the treatment of the majority of infections of the female genitalia. The chief difficulties in the procedure are the isolation and identification of the pathogenic organism and the determination of its point of entry.

The technique consists in injecting into the mucosa at the primary focus (Skene's glands, Bartholin's glands, urethra, or cervix) increasing doses of the specific vaccine, beginning with from 0.10 to

0.20 c.c.m. A reaction manifested by chills, elevation of the temperature, nausea, intense headache, and radiating pains occurs from thirty minutes to two hours after the injection and lasts for from ten to twelve hours.

The results in nineteen cases of pelvic inflammation and one case of gonorrheal arthritis were as follows:

Acute forms (seven cases): cure in four cases, improvement in three cases.

Subacute forms (six cases): cure in three cases, improvement in three cases.

Chronic forms (six cases): cure in three cases, improvement in three cases.

Gonorrheal arthritis (one case): cure.

The violent reactions make it necessary to restrict the use of the method to hospital practice. Regional vaccine therapy applied at the primary focus gives good results in acute and subacute infections of the genital tract and is especially indicated in arthritis.

HAROLD C. MACK, M.D.

Dougal, D.: Obstructive Inflammatory Lesions of the Uterus. *J. Obst. & Gynec. Brit. Emp.*, 1931, **xxxviii**, 46.

This article is based on a study of ten cases of gynaetris and is intended to direct further attention to this problem by showing that suppression or retention of the menses may follow obliterative or atresic inflammatory lesions of the genital canal.

The ten cases are reported in detail. The author draws the following conclusions:

Tuberculosis or some other acute infection of childhood may produce atresia of part of the genital canal. The resulting disturbance of function will depend upon the site of the obstruction.

In tubercle, the fallopian tubes and uterine cornua are the parts most commonly affected. Their canals may either become completely obliterated or filled with pus or blood.

If the cavity of the uterus is obliterated, retained secretions or blood may be found in the fallopian tubes, but if the atresia is at the level of the internal os, hæmatometra or pyometra will usually result. When the obstruction is below the level of the cervix, hydrometra is an additional possibility. In the cases of hydrometra reported, the source of the mucus was the cervical glands and the excessive quantity may have been due to increased secretion resulting from the acute pelvic congestion associated with the original infective lesion. Phillips has reported a case of hydrometra with tuberculosis in which the uterus was distended to the size of a seven months' pregnancy.

It is impossible for the gynecologist to do more than guess at the sequence of events in these cases

of infection and atresia as he has so little knowledge regarding the effects of infantile diseases on the genital organs. The gynecologist should know something about the frequency of vaginal discharge in diseases such as scarlet fever and diphtheria and should be able to follow these cases to puberty to determine the extent of the damage done to the uterus and adnexa.

It would be of advantage for the gynecologist to have a closer relation to hospitals for the treatment of children's and infectious diseases in order that he might keep such cases under observation until the effects, if any, on reproductive life can be determined. This would be advisable not only for the study of such serious lesions as those described in this article, but also for the investigation of less severe conditions in which nothing more serious results than sealing up of the fallopian tubes or the formation of adhesions about the uterus or adnexa.

HARVEY B. MATTHEWS, M.D.

Spirito, F.: Two Peculiar Fibromyomata of the Uterus (A proposito di due speciali fibromiomi dell'utero). *Rassegna internaz. di clin. e terap.*, 1931, xii, 147.

The author reports a hæmolytic and a red fibromyoma of the uterus. The hæmolytic tumor had the property of producing hæmolysis *in vitro* and a profound anemia in the patient which was out of proportion to the degree of the metrorrhagia. The red tumor was an angiomatoid fibromyoma.

Red tumors of the uterus have a varied cellular structure. They may be fibromyomata with small or large areas of necrobiosis or angiomatoid fibromyomata showing young muscle and connective tissue cells, numerous young capillaries, and numerous interstitial hemorrhages.

After reviewing the symptoms in 693 cases of fibromyoma of the ordinary type, Spirito concludes that the red fibromyomata do not give rise to characteristic symptoms differentiating them from fibromyomata of the ordinary type.

The best treatment for red fibromyomata is surgical removal. Radium and roentgen treatment are contra-indicated as it is difficult to determine whether degeneration is absent in the tumor, and in fibromyomata of the angiomatoid type irradiation is ineffective.

PETER A. ROSE, M.D.

Pouey, E.: Results of Treatment of Cancer of the Cervix, Principally with Radium, in the Last Seven Years (Résultats du traitement du cancer du col principalement par le radium, dans les sept dernières années). *Gynécologie*, 1931, xxx, 140.

In the last seven years the author has treated 217 cases of cancer of the cervix. Eighty-six of the patients are living (40 have been apparently cured from three to seven years), 78 are dead, and 53 cannot be traced. A cure was obtained most frequently in the cases in which the lesion seemed to be limited to the cervix, but in some of the cases cured for more than five years, infiltrations of the

ligaments and even of the bony walls of the pelvis were found at the beginning of the treatment. The infiltrations did not always disappear quickly. In some cases they increased, but later disappeared permanently without any further treatment. These facts suggest the existence of a local organic defense which it would be unwise to weaken by untimely treatment.

Internal focal curietherapy is the most efficacious. Whenever possible, the author introduced into the uterine cavity 1 or 2 tubes of radium filtered by 1 mm. of platinum and 1 mm. of gummed tissue (LaMotte's sound). At the base of the vagina, in the lateral cul-de-sac when these were present, he placed 2 more tubes filtered by 2 mm. of platinum and 2 mm. of cork or ametallic rubber and enveloped in gauze. The treatment was usually continued a week, a total of 50 mcd. being given. In case of intolerance, it was interrupted for a few days. The tubes were removed, cleaned, and replaced every two days. They were fixed in place by means of vaginal tampons saturated with "gomenol." Traumatism was reduced to the minimum. When the uterine orifice was invisible in the midst of gangrenous masses the crater was irradiated before the tubes were introduced into the uterus. At the end of the treatment plaques of radium-inflamed epithelium were often found, but a true radium necrosis was rare.

Infection of the tumor, inseparable from neoplastic proliferation, is a serious obstacle to radium therapy. The patient should not be subjected to repeated traumatizing examinations. In the author's cases, the lesion is first attacked with chloride of zinc (Canquoin paste) or with the electrocoagulation, galvanocautery, or thermocautery. Vaginal baths with different antiseptics are given. Very vegetative and voluminous masses are extirpated with scissors, the curette, or the electrocoagulation knife.

Of 35 patients receiving doses less than 40 mcd., 8 cannot be traced, 13 are dead, and 14 are living. Some of those still living have survived more than five years. Of 22 patients who received more than 60 mcd., 7 cannot be traced, 9 are dead, 1 has survived five years, and 5 have survived for from two and a half to four years.

Of 8 patients with cancer of the stump after subtotal hysterectomy, 2 are dead, 1 cannot be traced, and 5 are living. Of 17 patients with endocervical cancer, 10 are dead or cannot be traced and 7 are living. One of the latter was inoperable eight months ago, but 6 have been cured four and a half, five, five and a half, and six and a half years respectively. Two patients who were treated nine and a half and twelve years ago respectively are still alive.

In Pouey's opinion, the results were not much modified by the complementary use of transcutaneous radium therapy. Penetrating roentgen therapy has been used before or after radium therapy with good results. Occasionally it was the only treatment, and in rare cases it resulted in a cure. In the cases of some of the patients who appeared

to be cured hysterectomy was done. No lesions were found in the tissue removed. Exeresis following radium therapy does not always prevent recurrence. Sometimes a recurrence develops years later in glands more or less remote from the primary lesion.

The author reports 18 cases.

FACE.

Graves, W. P., and Smith, G. Van S.: *Olshausen's Operation for Suspension of the Uterus; A Review of 3,358 Cases Operated upon at the Free Hospital for Women, Brookline. Surg., Gynec. & Obst.*, 1931, lili, 1028.

The authors state that Olshausen's operation has been found most effective for suspending the displaced uterus. The defects in the original technique have been corrected. The technique now employed is described and the indications are discussed.

The advantages of the operation are its technical simplicity, the rapidity with which it can be performed, the support it gives, its applicability to all degrees of prolapse, the fact that it does not prevent later pelvic operations, and the fact that it may be performed in the child-bearing period without danger of causing dystocia. MACNUS P. URNES, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Jaschke, R. T. von: *The Suspensory and Supporting Structure of the Female Genitalia* (Stuetz- und Haftapparat des weiblichen Genitales). *Ztschr. f. Anat.*, 1931, xciv, 373.

The author points out that anatomists and clinicians are not yet in complete agreement as to whether the muscular supporting apparatus of the pelvic floor or the suspensory action of the pelvic connective tissue is the more important in maintaining the uterus in its normal position. This question had its origin in the classical researches of Halban and Tandler, who believed that the muscular pelvic floor is alone of importance in this respect. In 1909, Bumm and Martin claimed that the suspensory action of the pelvic connective tissue is the only factor of importance as Martin was able to demonstrate by faradic stimulation that the levator functions primarily as a powerful contractile muscle, Von Jaschke regarded this theory as fundamentally erroneous. In 1912, von Jaschke stated that the suspensory and supporting structures constitute a physiologico-anatomical entity. Later, Halban arrived at the same conclusion, but Tandler did not.

Von Jaschke now offers new evidence in support of this view from the field of clinical anatomy, a field of research open only to the surgeon who performs operations for uterine prolapse. He states first that, from the standpoint of function, the suspensory and supporting structures cannot be separated. In every instance of insufficiency of the suspensory structures (whether due to a defect or constitutionally or acquired weakness) an abnormal burden is thrown upon the muscular supporting structures, and when the functional capacity of the latter is surpassed prolapse occurs through the incom-

pletely closed genital hiatus which acts as a hernial ring. In the same way, when there is a defect or a constitutional or acquired weakness of the muscular apparatus, the uterus is supported chiefly by the connective tissue structures. However, the latter are less capable of withstanding an added burden than the more massive and differently constructed pelvic floor with its thick muscle layer and its caudally and cranially radiating fasciae which cannot be separated even by the most skillful operator.

In practice, however, isolated injuries of one or the other apparatus are never found. Injury to the muscular structures always causes simultaneous injury to the suspensory system, and vice versa. When hypotonicity of the uterus is present, retroversion and retroflexion take place, which, as is well known, favor prolapse.

The supporting and suspensory structures of the uterus may be compared to a bridge. According to the point of view, a load passing over the bridge may be considered as being suspended by the iron structural work or supported by the pillars, but in reality both suspensory and supporting structures are inseparably related to the function of the bridge. Surgical experience has shown that methods for the treatment of prolapse which attempt merely to reconstruct the suspensory structures are equally as ineffective as those which aim exclusively at the repair of the muscles of the pelvic floor.

H. FUETH (G).

Geller, F. C., and Krinke, I.: *The Permanent Results and Efficacy of Conservative Treatment of Adnexal Inflammations as Compared with Surgical Treatment* (Ueber die Dauererfolge der konservativen Behandlung von Adnexitiden und ihre Leistungsfähigkeit im Vergleich zur operativen Behandlung). *Monatsschr. f. Geburtsh. u. Gynæk.*, 1930, lxxxvi, 288.

Corresponding to the study of the results of surgical treatment of adnexal inflammations, this article deals with results following conservative therapy.

The evaluation of the treatment is based upon the relief of the symptoms, regression of the adnexal enlargement, and the occurrence of subsequent pregnancies. From two to five years elapsed between the treatment and the check-up examination. A total of 362 cases were included in the study. Some of the patients were treated by the application of heat (sitz baths, arc light, and diathermy), others by vaccino-therapy or protein injections, and a third group by posterior colpotomy for massive exudates and large pyosalpinx. The average duration of the treatment was twenty-five days. Surgical intervention was subsequently necessary in 35 cases (21.6 per cent). One hundred (78.7 per cent) of the patients remained asymptomatic. Of the 51 women who reported for re-examination, the adnexal enlargement had disappeared in 26 (50.9 per cent). Twenty-three and eight-tenths per cent became pregnant after the treatment.

Approximately the same results were obtained with heat as with injection therapy. Even 17.5 per cent of the women with bilateral adnexal involvement became pregnant after the conservative treatment. The end-results show that an equal number of patients were asymptomatic after conservative therapy as after radical surgery and more remained well after conservative non-surgical treatment than after conservative surgery. Pregnancy followed conservative treatment more often than conservative operations, which carry the risk of primary surgical mortality.

The investigation led to the conclusion that adnexal inflammation should first be treated conservatively, (by repeated courses of treatment when necessary), and surgical treatment should be considered only after total failure of conservative methods.

HARTMANN (G).

Frankl, O.: Struma Ovarii Associated with a Granulosa-Cell Tumor (Struma ovarii bei Granulosazelltumor). *Zentralbl. f. Gynaek.*, 1931, p. 21.

The author reports a case in which a tumor the size of a pigeon egg and with characteristics of a granulosa-cell neoplasm developed on the left ovary, and serial sections of the right ovary which was somewhat enlarged revealed a pea-sized inclusion of typical thyroid tissue. The area of thyroid tissue contained also large and small cell groups which closely resembled parathyroid tissue, but could not be identified definitely.

In the author's opinion, there was no causal relationship between the thyroid tissue in the ovary and the granulosa-cell tumor, and the thyroid tissue developed from a heterotopic cell anlage.

ZACHERL (G).

Petit-Dutailh, P.: The Roentgen Demonstration, After the Injection of Lipiodol, of Tubal Impermeability and Perimetrosalpingeal Adhesions. Its Exactness, Its Uncertainties, and Its Limitations (Démonstration radiologique après injection de lipiodol, des imperméabilités tubaires et des adhérences péri-méto-salpingiennes. Ses précisions, ses incertitudes, ses limites). *Gynécologie*, 1931, xxx, 5.

The author presents a series of forty-one pelvic roentgenograms made after lipiodol injections which demonstrate anatomical and spasmodic obstructions of the fallopian tubes and peritubal and periuterine adhesions. He discusses a variety of pathological conditions: obliteration of the uterine ostium of one of the fallopian tubes by a fibroma, obliteration of both uterine ostia by salpingitis, and obliteration of the lumen of a fallopian tube by spasm, cystic salpingitis, hydrosalpinx, ruptured tubal pregnancy, or adhesions.

Impermeability of the fallopian tubes at their junction with the uterus which is due to anatomical conditions may resist even the greatest pressure permissible (200 mm. Hg.) but when it is due to

spasm, a slight organic lesion, mucus, or congestion, it may be overcome. If it is bilateral and does not yield after fifteen minutes to a pressure of from 150 to 200 mm. Hg, it is usually due to a chronic obliterating salpingitis and cannot be corrected. Obstruction of the abdominal ostium of the tubes is due as a rule to inflammation. Obstruction of the middle portion of the tubes is usually spasmodic and temporary. Pelvic adhesions frequently result from nearby inflammation, most frequently inflammation of the appendix. Such adhesions may cause deformity and torsion of the tube or lateral flexion or tension on the uterus. The author believes that the mechanisms cited may cause a functional obstruction of the tubes.

JACOB E. KLEIN, M.D.

EXTERNAL GENITALIA

Apajalahti, A.: The Causes and Treatment of Fistulae of the Urinary Tract and Vagina, with Particular Regard to Quadruple Catgut Suture (Ueber die Ursachen und die Behandlung der Harnwegs-Scheidenfisteln mit besonderer Berücksichtigung der Methode der vierfachen Catgutnaht). *Acta obst. et gynec. Scand.*, 1931, xi, 1.

This report is based on 209 cases of fistula between the vagina and urinary tract which were treated in the period from 1861 to 1919. Nine of the fistulae were urethrovaginal, 180 were vesicovaginal, 9 were vesicocervical, 8 were uterovaginal, 2 were fistula scars, and 1 was of a fistula of unknown site. On the basis of their causes, these fistulae may be grouped as follows:

1. Obstetrical fistulae, 154: (a) fistulae caused by pressure, (b) fistulae due to obstetrical operations.
2. Gynecological fistulae, 39: (a) fistulae due to operations, 27; (b) fistulae caused by the pressure of a pessary, 3; (c) fistulae caused by attempts to induce criminal abortion, 2; and (d) fistulae of pathological origin, 7 (5 due to carcinoma, 1 to tuberculosis, and 1 to typhus).

The incidence of fistulae originating at the time of delivery was high in the cases of old primiparae and multiparae. It was higher in the cases of primiparae than in those of multiparae. In the cases of primiparae the average duration of spontaneous delivery was four days and the average length of operative delivery three and nine-tenths days. In the cases of multiparae the average length of spontaneous delivery was two and eight-tenths days and the average duration of operative delivery one and nine-tenths days. The delivery was spontaneous in 56 of the cases, operative in 69, and of unknown type in 30. One hundred and twenty-seven of the infants (97 per cent of the total number) were still-born. The operative deliveries included 28 embryotomies or perforations, 30 forceps extractions, 2 extractions, 2 versions, and 3 instrumental deliveries. Four of the patients were delivered by untrained practitioners.

Gynecological fistulae are usually the result of removal of the uterus. Of a series of cases of car-

cinoma of the uterus treated by complete abdominal hysterectomy in the period from 1901 to 1929, a vaginal fistula developed in 3.8 per cent. In most of the cases of vaginal fistula, Wertheim's operation had been done.

The most important conservative method of treating the fistula is permanent catheterization. Of 43 cases treated conservatively, healing resulted in 10.

One hundred and fifty-nine of the cases of fistula reviewed were treated surgically, 260 operations being performed. Of the patients traced, 118 (about 74 per cent) were cured, 21 were benefited, 15 were not benefited, and 2 died. The frequency of healing decreased after each operation. After the first operation healing occurred in 60 per cent of the cases; after the second, in 30 per cent; after the third, in 24 per cent; after the fourth in only 10 per cent; and after the fifth operation, in none.

The incidence of healing after the various operative methods was as follows: American method, 61 per cent; flap-cleavage method, 45 per cent; four-fold catgut suture method, 87 per cent; flap plastics, 27 per cent; uterus plastics, 33 per cent; ventrovaginal method, 0; and abdominal method, 0.

The quadruple catgut-suture method has given the most favorable results. The bladder wall is sutured with catgut No. 0 or 1, and the paravesical connective tissue, the paravaginal connective tissue, and the vaginal wall each separately with catgut No. 3. Care is taken to leave no cavities where blood or other tissue fluid may accumulate. The vaginal wall is sewed with catgut in order that it may be unnecessary to remove the stitches later.

MISCELLANEOUS

Gram, H. C.: A Triad of Postclimacteric Symptoms (Eine postklimakterische Symptomentrias). *Ugesk. f. Læger*, 1930, ii, 999.

Adiposis dolorosa, arterial hypertension, and arthritis of the knee constitute a triad of symptoms frequently occurring in women during the period following the menopause. This combination of symptoms may be considered a clinical entity and treated as such. In hospital as well as private practice, women with these symptoms are treated from very different points of view according to which symptom most attracts the attention of the physician. Not infrequently such women are considered to be neurasthenic, especially when their complaints are based chiefly on the subcutaneous infiltrations.

The author reviews sixty cases. With one exception, the patients were between forty and sixty-nine years of age. A few of them were uniparae and nulliparae, but the majority were multiparae. Generally the onset of the symptoms was quite insidious.

In one group of cases the menopause was induced artificially by X-ray or surgical castration. In this group, increasing obesity was the chief symptom, although the patients also complained of functional dyspnoea, palpitation, vague rheumatic pains and, in several instances, painful crackling knee joints.

Other complications frequently noted were varices, mild diabetes, flat-foot, arthritis deformans involving other joints than the knee, but rarely the elbow and fingers, nephritis, albuminuria, and ventral hernia.

In the physical examination, careful palpation of the subcutaneous tissues must not be neglected as it always reveals many tender areas. The tender areas are usually found over the vertebra prominens and in the arms, subscapular region, and legs. The subcutaneous fatty tissue in these areas is hard and infiltrated. Two types of infiltration can be distinguished, the so-called rice-seed or worm-like infiltration described by Dercum, and the smooth plaque-like infiltration. There is no thyroid enlargement. Examination of the heart and lungs is negative. The blood pressure is usually increased, averaging 174 mm. Hg. The basal metabolism is usually normal or slightly increased, hypothyroidism as an etiological factor being therefore excluded.

The treatment consists of a carefully weighed low-calorie diet, the administration of thyroid extract, and massage. This often results in a considerable lowering of the blood pressure. Thyroid extract is without effect in other types of hypertension. Ovarian substitution therapy, which might be considered the most rational form of treatment, is expensive, and the efficacy of the preparations available at the present time is quite uncertain. Ovarian function must still be considered a complex problem.

SAENGER (G).

Quinto, P.: Demonstration of Antigens in the Diagnosis of Tuberculosis of the Genitalia of the Female (La ricerca degli antigeni per la diagnosi della tubercolosi genitale femminile). *Riv. Ital. di ginec.*, 1931, xii, 148.

Tuberculosis of the female genitalia is very difficult to diagnose. The author reviews the various attempts to make use of biological methods in its diagnosis and describes Piazza's method. In the latter procedure use is made of immune serum obtained from rabbits by injecting Koch's old tuberculin intraperitoneally in increasing doses. To 5 c.cm. of the patient's urine in a test tube (Tube A), 1/4 c.cm. of the immune serum is added. This test tube and a control tube (Tube B) containing 5 c.cm. of the urine alone are then placed in the thermostat at 37 degrees for twenty-four hours.

The reaction shows two phases, a precipitating and a lytic phase. The first phase is noted at the end of the twenty-four hours in the thermostat. When the reaction is positive, there is a precipitate in Tube A and none, or only a very slight one in Tube B. The second phase is shown by the biuret reaction. The urine in Tubes A and B is filtered into two other test tubes and 2 c.cm. of a solution of copper sulphate is slowly filtered into each. The second reaction is positive if the biuret reaction is positive in the first tube and negative in the second.

The author reports twenty cases of tuberculosis of the female genitalia in which he made these tests.

In all of the cases the reactions were positive, whereas in all of fourteen cases of such conditions as tumors, inflammation of the adnexa, and puerperal infection the reactions were negative.

Quinto concludes that the Piazza reaction is distinctly specific for tuberculosis and particularly valuable in the differential diagnosis of tuberculosis of the adnexa. It may be carried out with natural immune serum taken from persons with active tuberculosis as well as with artificial immune serum; in fact, the reaction with the natural serum seems to be more sensitive than that with artificial serum.

AUDREY G. MORGAN, M.D.

Chalier, A.: The Prophylaxis of Postoperative Phlebitis and Embolism in Gynecology (*Sur la prophylaxie des phlébites et embolies post-opératoires en gynécologie*). *Bull. et mém. Soc. nat. de chir.*, 1931, lvii, 216.

The author believes that phlebitis after gynecological operative procedures is usually aseptic, and that suppurative lesions such as pyosalpinx give to the veins an immunity through autovaccination. Postoperative phlebitis and embolism are most common between the ages of forty and fifty years, when extensive operative procedures are also most frequent. They are favored by poor general condition, obesity, cardiorenal disease, varicosities of the limbs, hypercoagulability and hyperviscosity of the blood, and manipulation of the pelvic veins.

Except in emergencies, Chalier does not operate during an epidemic of grippé. In the absence of such an epidemic, he precedes operation, except in urgent cases, by preparation to correct hypotension

and the bleeding and coagulation times of the blood, if such treatment is indicated. He treats hypotension with digitalis, adrenalin, and the intravenous administration of glucose. To correct hypercoagulation and hyperviscosity of the blood he gives from 4 to 6 gm. of sodium citrate daily for ten, fifteen, or twenty days. For the prevention not only of phlebitis but also of postoperative pulmonary complications, he often uses a stock vaccine.

During the operation he suspends the patient in the Trendelenburg position by the ankles in order to prevent pressure on the veins of the lower extremities. He operates under spinal anesthesia as he believes this is least likely, of all types of anesthesia, to favor phlebitis. He handles the pelvic veins gently, ligates the vessels individually, and, when the uterus is to be removed, usually performs a total rather than a subtotal hysterectomy. Of a series of fifty-five subtotal hysterectomies, three were followed by phlebitis, whereas of thirty-seven total hysterectomies, only one was followed by phlebitis.

During the postoperative period, Chalier maintains the blood pressure by means of digitalis and the subcutaneous administration of saline solution or glucose, corrects hypercoagulability of the blood by the application of leeches for from two to twelve days, and prevents venous stasis in the pelvis and lower limbs by urging deep breathing and movement of the limbs as soon as the general condition will permit and by getting the patient out of bed early. In the absence of infection and hemorrhage, he usually gets the patient out of bed on the third or fourth day after the operation and starts her walking on the sixth day. JAMES B. MASON, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

J. R.: A New Method of Testing the Aschheim-Zondek Reaction (Un procédé nouveau d'application de la réaction d'Aschheim-Zondek). *Rev. mag. de gynéc. et d'obst.*, 1931, xxvi, 65.

1927, Aschheim demonstrated in the urine of mice in the very early stages of pregnancy a substance capable of producing a reaction in the urine of mice before puberty. The changes occurring in the ovary of the mouse are now known as "Aschheim-Zondek reaction." Fels found the substance causing this reaction produces changes also in the testicle of the mouse before puberty. The reaction in the male mouse is called "Fels reaction." The changes brought about in the testis of the mouse are maturation of follicles, hemorrhagic spots, and false corpora lutea. Only the first two are characteristic of pregnancy. The reaction consists in hypertrophy of the initial tissues of the testicle and of the seminal vesicles and prostate.

The author describes the various modifications of the test and his own technique. He uses male and female rats about a month old as puberty comes on in rats than in mice and rats bear the injections better than mice. The reactions are very evident in male and female rats after five injections. Therefore gives 5 daily injections of 1 c.cm. of urine to be examined. A single specimen of urine can be used for all of the injections as it can be kept in the refrigerator for from ten to fifteen days. The Germans advise adding a drop of trichresol to preserve the urine. The pale urine passed after sexual excitement should not be used as it contains a little of the substance. The morning urine is best. Of the 120 animals injected, only 2 died. The results resulted from convulsions which were probably due to special toxicity of the urine.

Positive reactions were never obtained with the urine of men, children, or non-pregnant women. The author reviews 17 cases which showed that the reaction is positive in ruptured extra-uterine pregnancy and in retention of the fetus for from eight to ten days after fetal death. It is negative in most other conditions. It was positive in the female rat with a case of genital carcinoma and in a case of carcinoma of the ovary, but in 1 of these cases it was negative in the male rat. The outcome of the test was proved accurate in all of 21 cases of difficult abortion. In 1 case of extra-uterine pregnancy the reaction was not macroscopically positive in the urine of the rat, but was distinctly positive in the male. In the reaction was controlled microscopically in most of the cases, it is essentially a macroscopic test.

The author concludes from his work that the Aschheim-Zondek test is very reliable and should be done on both male and female rats about a month old. A positive reaction is shown macroscopically in these animals by the presence of false corpora lutea in the ovary and hypertrophy of the seminal vesicles. The male is more sensitive to the reaction than the female. The test should be used in all cases in which the diagnosis of pregnancy is difficult or doubtful. AUDREY G. MORGAN, M.D.

Uffenorde, H.: A Contribution to the Problem of Unequal Development of the Fetuses in Multiple Pregnancy (Beitrag zur Frage ungleicher Fruchtentwicklung bei Mehrlingsschwangerschaft). *Zentralbl. f. Gynaek.*, 1930, p. 3156.

A thirty-five-year-old multipara was brought to the Marburg Gynecological Clinic after an abortion which occurred between the second and third months of pregnancy as a result of a trivial accident.

Careful examination of the membranes disclosed a 5.5-cm. fetus with a somewhat torn amniotic and chorionic sac measuring 8 by 4 by 5 cm. and a second amniotic sac measuring 7 by 5 by 5 cm. which was intact, filled with fluid, and contained a smaller fetus 1.3 cm. in length. The development of the larger fetus corresponded to the duration of the pregnancy, whereas the smaller fetus appeared to be four or five weeks old at the most. While the larger fetus appeared to be normally developed, the smaller one showed an anomaly of the cranium (anencephalus). In spite of the inequality in the body length of the embryos, both amniotic sacs were of the same size and showed no macroscopic nor microscopic pathological changes.

The case presented the interesting finding of a three-month-old twin pregnancy with unequally developed embryos without evidence of maceration and with no degenerative changes in the amniotic sacs. On account of the equality in size of the amniotic sacs, the unequal development of the twins cannot be ascribed to either superfetation or superfecundation. It was possible that the cause was a roentgen injury as the patient had been subjected to roentgen sterilization seven years previously. OEDENTHAL (G).

Robinson, A. L., and Duvall, H. M.: Torsion of the Pregnant Uterus. *J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 53.

Primary torsion of the pregnant uterus is one of the rarest and most dangerous accidents in obstetrics. The authors report cases of such torsion and review the literature on the condition.

In almost all cases there is obvious asymmetry due to a congenital condition such as a bicornate

uterus or to an acquired condition such as a tumor, adhesions, or an acquired deformity. The most common factors favoring torsion of the uterus are bodily movements with rotation of the trunk, contraction of abdominal muscles, and variations in the size of the bladder and rectum.

The symptoms are due to constriction of the structures of the pedicle of the uterus, and simulate those of ectopic pregnancy, accidental hemorrhage, obstructed labor, and peritoneal crises.

The diagnosis is exceedingly difficult, but is aided by the history, the findings on physical examination of the uterus, and the presence of spiral folds in the vaginal mucosa.

The reduction of cervical torsion by manipulation should be restricted to mild cases in early pregnancy in which the general condition is good. In acute torsion, the treatment should be immediate operation rather than temporary measures for alleviation of the shock.

MAGNUS P. URBES, M.D.

Garofolo, A.: The Calcium Content of the Blood During Pregnancy and the Puerperium (Contributo allo studio della calcemia in gravidanza e in puerperio). *Clin. ostet.*, 1931, xxxiii, 65.

The author has studied, by the Kramer and Tisdall method, the variations in the blood calcium which occur during pregnancy, delivery, and the puerperium.

In the ten cases in which observations were made during pregnancy, the amount of calcium in the blood was normal during the first months, but hypocalcemia was present during the last six or seven months. The hypocalcemia reached its maximum in the seventh month. As the degree of calcium-ion dissociation cannot be determined by ordinary methods of investigation, the presence of a hyp-ionia or hyper-ionia—which is possible even when the calcium content of the blood is low—could not be determined.

Hypocalcemia in pregnancy is probably due to a number of factors such as hydremia, retention of minerals in the maternal tissues, disturbances of calcium metabolism caused by the action of incretions changed or created by the pregnancy and affecting particularly the vegetative nervous system, instability of the renal function which permits an enormous filtration and excretion of salts, and the mineral needs of the fetus. The author concludes that pregnancy is associated with a mobilized lability of the calcium of the blood and tissues.

In the ten cases in which observations were made during delivery, the amount of calcium in the blood serum was increased above the normal. The author believes that this increase represents the final effort of the organism to put the uterus in the best possible condition for the successful accomplishment of labor.

In the seventeen cases in which observations were made during the puerperium there was a slight hypocalcemia for a few days and then a return to normal values.

In cases of abortion, the blood calcium showed changes similar to those noted in normal pregnancy up to the time at which the abortion occurred.

In four cases of eclampsia (three studied during labor and one during the puerperium), the author found both marked and moderate hypocalcemia and also an increase in the blood calcium. However, he does not believe that these findings were referable to the disease or that the changes in the calcium metabolism were involved in the pathogenesis of the eclampsia.

MARGUERITE P. SLOAN.

Daly, P. A., and Strouse, S.: The So-Called Medical Complications of Pregnancy. *J. Am. M. Ass.*, 1931, xcvi, 1655.

The authors reject the theory that the various medical conditions sometimes associated with pregnancy are complications of the pregnancy. They regard the medical condition as of paramount importance and the pregnancy as the complication.

Unfavorable prognoses for pregnant women with heart disease or diabetes are based almost entirely on comparisons of ill pregnant women with well pregnant women. No attempt is made to compare the statistics of ill pregnant women with the general statistics on the same illness in non-pregnant women of the same age. Attention being directed chiefly to the obstetrical aspects of cases of pregnancy with complications, a paradoxical philosophy of therapy has developed. A case of organic heart disease or of diabetes mellitus in which a surgical condition affecting the kidney develops remains primarily a medical case with surgical complications, but a case of organic heart disease in which pregnancy supervenes is treated as a case of pregnancy with medical complications. Cases of pregnancy with so-called medical complications are better managed when attention is directed chiefly to the medical aspects. On the basis of this theory the authors have maintained at the Chicago Lying-In Hospital a medical clinic in which pregnant women with medical conditions are treated chiefly by the internist and the obstetrician becomes the consultant. It has been found that in this clinic better therapeutic results are obtained. Diabetes and the glycosurias of pregnancy are treated more efficiently. It was discovered that unrecognized benign glycosurias of the renal type had been overtreated as severe diabetes, with poor results, whereas in subsequent pregnancies, the condition being recognized and understood, was controlled with little or no treatment. Failure to differentiate the type of glycosuria may result in the use of an unbalanced diet for many months of pregnancy with possible further injury to the metabolism endangering the life of the mother or the fetus.

In discussing cardiac disease in pregnancy the authors state that an internist constantly treating cardiac conditions is better able than an obstetrician to treat a pregnant woman with a heart lesion. Except for the extra mechanical burden of pregnancy, the pregnant woman with heart disease

presents exactly the same conditions as the non-pregnant woman. There is no specific problem involved in pregnancy. In the management of patients with chronic heart disease during pregnancy the most important factor to be considered is the added burden placed on the heart by the pregnancy. The object of treatment should be to maintain or increase the cardiac reserve so that there will be sufficient muscular efficiency toward the end of the pregnancy and during labor when the demands are greatest. The most frequent form of overtreatment is too much rest in bed.

In an investigation of the most remote effects of pregnancy on the diseased heart the authors noted no appreciable difference at the end of a year or two or five years between the women with a cardiac condition who had gone through pregnancy and women with a similar heart lesion who had not been pregnant. There is the same tendency toward progression of the heart lesion, the same liability to overwork, and the same penalty for excessive work whether the work is necessitated by pregnancy or effort. The average life of women with heart disease is about the same whether pregnancy has occurred or not.

A diseased heart which has not failed during pregnancy and is not in a stage of decompensation at the time of delivery should not suffer a fatal failure because of delivery. Cardiac decompensation at the time of labor has a grave prognosis whether the labor occurs in the seventh or the ninth month. As a rule it is fatal. Induction of labor should not be attempted in the presence of heart failure, by cesarean section should be avoided if possible until compensation is restored.

Thyroid changes may be a dominant factor in the production of sterility, miscarriage, and certain toxemias of pregnancy. Pregnancy has an influence on the thyroid gland. Even thyroids usually called normal are subject to both anatomical and functional changes during the course of pregnancy. As a rule there are no indications of a change in function, but in a small percentage of cases there are symptoms such as nervousness, tachycardia, insomnia, headache, and an increase in the blood pressure suggestive of mild hyperthyroidism but without loss of weight or a definite increase in the metabolic rate above the normal. When this syndrome occurs it is noted between the fourth and sixth months of pregnancy. It lasts for from four to six weeks if not treated, but responds to iodine in a few days.

Pregnancy beginning during a phase of hyperthyroidism and continuing is rare. Hyperthyroidism favors miscarriage, usually in the first three months. Patients with a history of toxic cycles have a tendency toward recurrence of hyperthyroidism during pregnancy.

The pregnant woman with hypothyroidism presents a picture of mixed endocrine disturbance and is subject to toxemias, cedema, albuminuria, hypertension, pre-eclampsia, and eclampsia.

CHARLES F. DuBois, M.D.

McIlroy, Dame, L., and Rendel, O.: *The Problem of the Damaged Heart in Obstetrical Practice.* *J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 7.

This article is based on a series of 200 cases of heart disease in which there were 226 pregnancies. All of the women were studied intensively by a cardiologist working with a specialist in obstetrics. Most of them were followed through their entire antenatal, intrapartum, and postpartum periods and, so far as possible, were kept under observation for several months or years.

The classification used was that outlined by the American Heart Association which divides the cases into the following classes:

Class 1. Patients with organic heart disease who are able to carry on ordinary physical activity without discomfort and show no signs of congestive heart failure or active cardiac disease.

Class 2. Patients with organic heart disease who are unable to carry on ordinary physical activity without discomfort. A. Those whose activity is only slightly limited and who rarely show signs of congestive heart failure or active infection. B. Those whose activity is greatly limited and who generally show one or more signs of congestive heart failure, the anginal syndrome, or signs of active heart infection.

Class 3. Patients with organic heart disease with symptoms or signs of heart failure when they are at rest, who show marked physical signs of congestive heart failure, the anginal syndrome, or active infection.

The number of primigravidae and multiparæ in each class is shown in the following table:

Class	Primigravidae	Multiparæ	Total
1 A	35	23	58
2 B	48	47	95
3	14	49	63
	2	8	10
	99	127	226

Another table included in the article gives the specific heart lesions present. The most common cardiac condition in all classes of cases was mitral stenosis with enlargement of the heart. In 137 cases there was a history of rheumatic fever or chorea, of both rheumatic fever and chorea, or of tonsillitis, and in 16 cases there was a history of scarlet fever. In 47 cases there was no history of a condition which would explain the heart lesion.

Of the cases belonging to Class 1 and Class 2 A, the condition during pregnancy, labor, and the puerperium was satisfactory in all and the ultimate result was good in the majority. Damage to the heart from the pregnancy occurred in only a few. In the cases belonging to Class 3 there was considerable disability and 65 per cent of the patients presented signs of congestive failure at some period during the pregnancy. Five patients in these 2 groups died, the mortality being therefore 2.5 per cent.

Factors of importance in the prognosis are: (1) the nature and severity of the lesion, (2) the functional efficiency of the heart, (3) a history of rheumatism, attacks of decompensation, hæmoptysis, and (4) the presence of an associated myocardial lesion indicated by the electrocardiograph, the presence of arrhythmia, such as auricular fibrillation or flutter, or partial or complete heart block.

The authors draw the following conclusions:

1. Efficient treatment of heart disease complicated by pregnancy depends upon early antenatal examination and co-operation between the obstetrician and the cardiologist.

2. An antenatal clinic is essential in an obstetrical hospital.

3. Accurate methods of diagnosis, such as electrocardiography, are necessary for suitable treatment.

4. Skilled medical treatment has considerably decreased the indications for the artificial termination of pregnancy.

5. Heart disease of moderate severity does not preclude successful pregnancy, provided efficient care is given throughout the antenatal period, delivery, and the postnatal period. The factor of chief importance is rest. However, it must be borne in mind that every pregnancy causes a heavy strain on the damaged heart and that even in cases of mild cardiac conditions, recovery of the former functional efficiency of the heart will take time and, in spite of every attention, may be incomplete. In cases of severe cardiac lesions the patient may possibly be changed to a heart category of a lower grade. It is more important to prevent the occurrence of pregnancy than to terminate it, since termination is likely to be successful only if it is performed in the early stages of the pregnancy. Rest, regulation of the diet, and general hygiene are often of greater importance than drugs in the successful management of heart disease complicated by pregnancy.

6. Labor should be made as easy as possible by the use of sedatives and intermittent anaesthesia. In severe cases, delivery by forceps may be indicated to shorten the second stage.

7. Every patient should be followed up for several years after the pregnancy.

HARVEY B. MATTHEWS, M.D.

Bramwell, C.: Heart Disease Complicating Pregnancy. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 709.

The author states that in the more severe types of heart disease, pregnancy should be forbidden or should be terminated in the first three months. In the less severe types, it should be allowed to pursue its course under careful medical supervision.

CARL H. DAVIS, M.D.

Pestalozza, E.: Fibromata in Pregnancy (Fibromi in gravidanza). *Riv. ital. di ginec.*, 1931, xii, 97.

The author reviews an experience of forty years in the surgical treatment of fibromata complicating pregnancy. He gives statistics on 116 operations performed for the removal of fibromyomata during

pregnancy, labor, or the puerperium. All of the 68 patients subjected to myomectomy or hysterectomy during pregnancy survived. Among the 39 cases in which myomectomy was done there were 6 abortions, but only half of them could be attributed to the operation. During labor, 6 myomectomies were performed with good results, 21 hysterectomies with 16 recoveries, and 1 simple cesarean section. Seven of the hysterectomies with good results were performed during the third stage of labor. During the puerperium, 3 myomectomies and 10 hysterectomies were performed with 12 recoveries. Two cases of operation for pedunculated adenomyoma during pregnancy are reported.

Pestalozza concludes that fibroma and pregnancy are not incompatible, and that many pregnancies complicated by fibroma can be carried to term without great danger to the mother or child. He emphasizes, however, that the mother should be carefully watched during the pregnancy and labor and should be put in condition so that operation can be performed at once if it becomes necessary.

AUDREY G. MORGAN, M.D.

LABOR AND ITS COMPLICATIONS

Taylor, W. A.: A Revised Conception of the Occiput-Posterior Position, with Which is Incorporated a Plea for the Adoption of the Conservative Attitude in Force at the Rotunda Hospital. *J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 85.

For cases of occiput-posterior position the author advises watchful waiting, the duration of which should be determined by the length of the first stage. He states that failure to deliver with forceps is usually ascribable to undue haste or an attempt to effect delivery when the head is out of the pelvis (high forceps). He emphasizes that careful bimanual examination under anaesthesia is essential to determine the exact position and height of the head.

CARL H. DAVIS, M.D.

Westman, A.: The Breech Deliveries at the University Gynecological Clinic at Stockholm in the Period from 1916 to 1930 (Ueber die Steissgeburten in den Jahren 1916-1930 an der Universitäts-Frauenklinik in Stockholm). *Acta obst. et gynec. Scand.*, 1931, xi, 112.

In the obstetrical department of the General Maternity Hospital in Stockholm there were 893 deliveries in cases of breech presentation during the period from 1916 to 1930. These constituted 2.3 per cent of all deliveries during that time.

There were practically no cases of contracted pelvis, abnormality of the uterus, or hydramnion. In a few cases the breech presentation was due to placenta prævia. Breech presentation was more common in primiparæ than in multiparæ. Its frequency was about the same in women under thirty years of age as in women over thirty years of age. In 24.6 per cent of the cases the delivery was premature.

The authors attribute the high mortality to the fact that the number of pathological cases is relatively high in large clinics. A substantial decrease in the early mortality is not to be expected from further improvement in the care of infants. The best results will be obtained from measures to prevent premature birth and from better care of women during pregnancy. The care during pregnancy must be instituted at the proper time and should include the entire maternal organism. A decrease in birth traumata may be expected from improvement in the training of physicians and midwives.

WILLE (G).

Morosova, A., and Raskina, M.: Stillbirths and the Mortality of Newborn Infants in the Grauerman Maternity Hospital in Moscow (Totgeburtten und Sterblichkeitshäufigkeit der Neugeborenen nach den Materialien des Grauerman-Entbindungsheims in Moskau). *Moskov. med. z.*, 1930, 2, 42.

This statistical study of the mortality rate at the Grauerman Maternity Hospital of Moscow covered 54,869 births which occurred during the years from 1924 to 1928, inclusive. The deaths are divided into 4 classes according to the time at which they occurred: (1) antenatal, (2) intranatal, (3) postnatal (during the period between birth and the first efforts at breathing), and (4) following the onset of respiration and within the first few days of life. Infants weighing less than 2,500 gm. and measuring less than 48 cm. in length were considered premature.

Stillbirths and neonatal deaths together amounted to 5 per cent of the total number, the stillbirths constituting 2.9 per cent and the neonatal deaths, 2.1 per cent. Of the stillbirths, death was antenatal in 28 per cent, intranatal in 59 per cent, and postnatal in 13 per cent. Sixty-one per cent of the stillborn infants were fully developed and 39 per cent were premature. Seventy per cent of the full-term infants died during delivery and only 18 per cent during the antenatal period, but of the premature infants an equal number (44 per cent) succumbed before and during delivery. No full-term infants died during the postnatal period.

Syphilis was the cause of antenatal death in 49 per cent of the cases, and 93 per cent of all macerated fetuses were luetic. Operative interference by the vaginal route was an important factor in intranatal death. Among the causes of death of full-term infants, septicæmia occupied the first place (24.7 per cent), then followed pneumonia (23.8 per cent), internal hemorrhage (18.1 per cent), and partial pulmonary atelectasis (15.2 per cent). Practically two-thirds of the premature infants died of congenital pulmonary atelectasis.

Forty-two per cent of the neonatal deaths occurred on the first day, one-third on the second day, and one-sixth on the third day. Seasonal factors apparently do not affect the mortality.

A SCHEINERMAN (G).

Coryllos, P. N.: Atelectasis, Asphyxia, and Resuscitation in the Newborn. *Am. J. Obst. & Gynec.*, 1931, xxi, 512.

The first respiratory movements immediately after birth produce important anatomical and physiological changes in the lungs. The lung dilates little by little and expands.

In the "opening" of the alveoli the resistance due to the cohesion and capillary tension of the alveolar walls which are in contact with the fetal lung must be overcome. In the dog, a positive pressure equal to 14 cm. of water is necessary to inflate the atelectatic lung.

The author contends that all pneumonias and bronchopneumonias in the newborn start as lobar or lobular atelectases due to obstruction of lobar or lobular bronchi. If the obstructing agent is artificially or spontaneously eliminated the lung will be re-aërated, its free drainage insured, and its means of defense restored.

Asphyxia in the newborn is a complicated phenomenon due to anatomical deficiency of the lungs, defective gas exchanges, and physiological imbalance of the respiratory center.

The anatomical factor, namely, persistent fetal or partial atelectasis of the lung, is always due to bronchial obstruction. It threatens immediate or delayed asphyxia because of anoxæmia due to defective gas exchanges, and predisposes to infectious complications such as pneumonia and bronchopneumonia, to which the largest number of deaths of newly born infants are due.

The importance of the curves of dissociation of oxyhemoglobin and of carbon dioxide, and especially their interrelationship in the study of asphyxia of the newborn, is discussed.

The importance of the "Bohr effect" and the "Hering-Breuer" reflex in resuscitation is emphasized.

The different procedures recommended for resuscitation, especially those of Henderson and Haggard, Flagg, and Drinker, are described. The author favors the procedure employed by Flagg.

E. L. CORNELL, M.D.

MISCELLANEOUS

Bell, W. B.: Maternal Disablement. *Lancet*, 1931, cxxx, 1571.

The author estimates that 10 per cent of all women are more or less crippled by childbearing. Of a large number of parous women treated for gynecological conditions at the Royal Infirmary in Liverpool, the condition in 34 per cent was found to be directly attributable to pregnancy and parturition. Pre-existing pathological conditions may be accentuated or lesions may be initiated by childbearing.

The most important nervous disorders associated with pregnancy are mental shock and puerperal insanity. Mental shock is of traumatic origin and almost always follows prolonged labor with severe

pain. It is rare when the pain is adequately controlled by anaesthesia.

While mental shock may occur in a patient with a good family history, this is not true of puerperal insanity. It is believed that other factors such as the toxæmia from infection or chemical auto-intoxication play a part. Puerperal insanity is not uncommon. It is a serious condition as about 30 per cent of the women fail to recover completely and 15 per cent die.

Of the neuroses, chorea gravidarum is the most serious. It appears in young women and usually in the first part of pregnancy. It is probably of toxic origin.

Mitral stenosis, with or without aortic regurgitation, is a very grave condition in pregnancy, especially when it is associated with auricular fibrillation. A sudden break in compensation may occur even when the patient is in bed in the hospital. Very careful prenatal care is important. In many cases it may be necessary to consider termination of the pregnancy by induction or caesarean section. Other vascular lesions made worse by pregnancy are varicose veins of the lower extremities, the vulva, and rectum, and arteriosclerosis.

Kidney disease, whether a pre-existing nephritis or a nephritis due to a toxæmia of pregnancy, is a very grave complication of pregnancy. In a large percentage of cases toxæmia recurs in subsequent pregnancies. The woman with chronic nephritis comes to pregnancy damaged and is likely to suffer further renal injury as a result of the pregnancy.

Various types of thyroid disease may occur in pregnancy. Atrophy of the ovaries and enlarge-

ment and increased activity of the pituitary gland, may cause disturbances. Diabetes is still one of the most serious constitutional complications of pregnancy even though its danger has been reduced by modern treatment.

Untreated dental infections may lead to puerperal sepsis. Dental caries associated with pregnancy is very common and is probably due to disturbance of calcium metabolism.

Pyelitis and cystitis in pregnancy are not uncommon and are often preventable or amenable to prompt treatment.

Pulmonary tuberculosis in an incipient or active phase has an unfavorable effect on pregnancy, but when the lesion is quiescent or healed little anxiety need be felt regarding it provided the patient is well nursed, suitably fed, and kept in a healthful environment.

It is generally believed that the growth of malignant tumors is stimulated by pregnancy. Benign growths, unless they are situated in the genitalia, are unaffected. Degeneration is common in fibromyomata.

Statistics presented show that, of the local lesions, from 30 to 43 per cent are created or aggravated by pregnancy and parturition, and that from 70 to 80 per cent of them cause disability due to trauma and infection. Cancer of the cervix is the most serious result.

The prevention of the local injuries and infections, which constitute at least 75 per cent of all causes of maternal disablement, depends upon the obstetrician, the nurse, and the midwife.

T. FLOYD BELL, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Lunoe, E.: A Study of the Unilateral Quantitative Function of the Kidneys and the Technique of Collecting the Urine by Ureteral Catheterization (Étude sur la fonction unilatérale quantitative des reins et sur la technique du recueillement quantitatif d'urine par cathétérisme urétéral). *J. d'uro. méd. et chir.*, 1931, xxxi, 113.

For the qualitative and quantitative study of renal function the author uses aspiration and a sound with multiple eyes. The aspiration is kept constant by a column of fluid about 90 cm. high contained in a rubber drain which is suspended from the ureteral sound. By this procedure it is generally possible to recover the urine which, with the use of the ordinary sound having fewer eyes, would descend the length of the sound and flow into the bladder. By simultaneous analysis of the blood, it is possible to make a complete study of renal function. PAGE.

Pedroso, G.: Closed Traumatism of the Kidney (Traumatismos cerrados del riñón). *An. de cirug.*, Havana, 1931, iii, 112.

In closed traumata of kidney there is no external lesion or at least none in communication with the kidney injury. Such traumata may be caused by direct or indirect contusion. The author reports the case of a man twenty two years of age who developed a traumatic hydronephrosis of the right kidney after a fall from a second story window in which he struck on his right flank and arm. There was no history of kidney disease before the injury. After the fall, laparotomy was performed because of abdominal rigidity suggesting a visceral lesion. The kidney bed was explored as hæmaturia had occurred, but no enlargement of the kidney was noted. A second laparotomy performed nine days later disclosed a retroperitoneal swelling. In the four days that elapsed before nephrectomy was performed this swelling doubled in size. The kidney showed multiple cavities and the compression of the parenchyma which is characteristic of hydronephrosis.

The prognosis in such cases depends on the severity of the injury. In cases of mild injury the hæmaturia soon stops, the pain decreases, and in a few days the patient is out of danger. In cases of severe injury, death may occur from shock, hæmorrhage, or infection of the hydronephrosis. The author believes that the hydronephrosis is caused by obstruction of the ureteral orifice by clots from the hæmorrhage. In cases of mild injury, expectant treatment should be given. Operation is indicated in cases with enlargement of the kidney and internal hæmorrhage for forty-eight hours or slight hæmaturia of longer duration. Conservative surgery is

impossible unless the operation is performed early. AUDREY G. MORGAN, M.D.

Bekkerman, A.: Renal Tuberculosis in Children (De la tuberculose rénale chez l'enfant). *J. d'uro. méd. et chir.*, 1931, xxxi, 236.

A review of the literature shows that renal tuberculosis in children is not so rare as is commonly supposed. The author was able to find the reports of 280 cases in children ranging in age from three months to sixteen years.

Opinions differ as to the manner in which the infection occurs as there is evidence indicating that it may be either congenital or acquired. Renal tuberculosis is most often recognized only at autopsy. Among the factors which may activate latent tuberculosis are malnutrition, trauma, intercurrent infections, metabolic disorders, and measles. The incidence of renal tuberculosis in children increases rapidly toward the age of puberty. Boys are affected more frequently than girls.

The diagnosis is more difficult in the cases of children than in the cases of adults. In the examination of children, cystoscopy and ureteral catheterization are usually neglected, but may be performed under anæsthesia without untoward effects. The diagnostic procedures should not differ from those employed for adults.

The chief evidences of renal tuberculosis are dysuria, polyuria, enuresis, pyuria, hæmaturia, and the presence of tubercle bacilli in the urine.

Nephrectomy should be performed in all cases in which the process is unilateral. It is indicated even in advanced cases. In children, the surgical mortality ranges from 16 to 38.9 per cent, whereas in adults it ranges from 17 to 25 per cent. In cases not treated surgically the mortality is usually inversely proportional to the ages of the patients. By some, tuberculin treatment is advocated.

The author reports four cases and abstracts fourteen case reports found in the Russian literature.

HAROLD C. MACK, M.D.

Dax, L.: Two Cases of Calculous Anuria Due to Calculi Invisibles to the X-rays (Deux cas d'anurie calculuse par calculs invisibles aux rayons X). *J. de méd. de Bordeaux*, 1931, cviii, 187.

The first case reported by the author was that of a man sixty-eight years of age who, for twenty years, had suffered periodically from nephritic colic which occurred sometimes on one side and sometimes on the other and was frequently followed by the expulsion of gravel. Two weeks before the patient was seen by Dax he had expelled three pieces of gravel the size of a grain of wheat. At the time of his examination by Dax anuria had been

present for forty-eight hours, but his general condition was good. Catheterization demonstrated that the bladder and urethra were free in spite of prostatic hypertrophy. Examination of the lumbar region disclosed contraction of the abdominal and lumbar muscles on the left side and pain on deep palpation over the kidney. The right side was normal. Roentgen examination of the urinary tract for calculi was negative, but in both ureters the catheter was arrested at a point 2 cm. from the bladder.

Three days after the onset of the anuria surgical intervention was found necessary. A left lumbar incision was made. Palpation of the upper part of the ureter and the renal pelvis was negative for stones. The kidney was somewhat enlarged and congested. Nephrotomy was done, a catheter introduced into the renal pelvis, and renal decapsulation performed. Medical treatment consisted of injections of glucose by Murphy drip and the administration of diuretics and cardiac tonics.

On the day after the operation, 500 c.cm. of urine were passed through the catheter, and on the second day, 800 c.cm. were passed by catheter and 200 c.cm. by way of the urethra. On the third day after the operation two stones the size of small peas were expelled from the urethra. Thereafter, all of the urine (1,500 c.cm. daily) passed through the bladder. Several days after the operation, four pure uric acid stones were expelled. The patient was discharged cured eighteen days after the operation.

The second case was that of a man sixty years of age who was suddenly seized with severe renal colic on the left side. There was no previous history of such colic. The attack was associated with oliguria of increasing severity. On the day of examination, 50 c.cm. of urine were passed.

Clinical examination disclosed slight distention of the abdomen and a point of tenderness in the left costolumbar region. Roentgen examination for stones was negative. In the left ureter a catheter could be passed only 3 cm. beyond the meatus. The right ureter was free from obstruction. The ureteral catheter on the left side was left in place and diuretics were administered. The amount of urine excreted gradually increased. On the third day, when the catheter was removed, 900 c.cm. of urine were passed. Several days later the patient had dull pains in the left side and expelled a dozen small uric acid stones.

The author states that with modern X-ray methods not more than 2 per cent of urinary calculi are invisible in roentgenograms. The stones composed of acid ammonium urate and those formed of pure uric acid are the most transparent to irradiation.

In the presence of anuria, the possibility of lithiasis, uterine cancer, and severe intoxication such as occur in subacute nephritis and toxic nephritis should be considered.

The treatment of calculous anuria consists of medical stimulation of diuresis and attempts to

cause spontaneous elimination of the stones. First, the bladder should be distended. If this is ineffective, ureteral catheterization should be tried. The renal pelvis should be distended moderately and the catheter left in position for two or three days. If catheterization of the obstructed ureter fails, the other ureter should be catheterized as in this way the inhibitory reflex is sometimes neutralized and diuresis is stimulated. If these measures fail, surgical intervention is indicated. Whether a pyelostomy or a nephrotomy is done, renal decapsulation should be performed. The success of surgical treatment depends on how soon it is given after the onset of anuria.

The postoperative treatment consists of the administration of diuretic drinks, theobromine, and cardiac tonics, and injections of glucose. In urgent cases, from 50 to 100 c.cm. of a hypertonic glucose solution (250 gm. per 1,000 c.cm.) are injected intravenously. In addition, saline purges may be given and small venesections may be done.

JACOB E. KLEIN, M.D.

Higgins, C. C.: Solitary Cysts of the Kidney. *Ann. Surg.*, 1931, xciii, 868.

Solitary cysts of the kidney are more frequent than is apparent from the literature. The number reported in the literature to date is 168. The author reports 10 cases from the records of the Cleveland Clinic.

The wall of a solitary cyst of the kidney is generally grayish white and varies from 1 to 5 mm. in thickness. Calcification is rare. The cyst usually contains clear, straw-colored serous fluid with a low specific gravity. Solitary renal cysts are most common between the ages of thirty and sixty years and are more common in the right kidney than the left kidney. In most cases they arise from the lower pole of the kidney. They vary in size from a few centimeters in diameter to a large sac containing a liter of fluid. They may be associated with calculous pyonephrosis, caseous tuberculosis, or hypernephroma.

Solitary cysts do not cause pathognomonic symptoms until they attain sufficient size to produce pressure or until they become palpable. When this occurs the patient may complain of vague abdominal discomfort and a sense of fullness or pain in the region of the kidney. Urinary symptoms may be entirely absent.

A roentgenogram may reveal the cyst, especially if it arises from the lower pole of the kidney.

Before operation, a pyelogram may show a normal kidney, functional tests may be normal, and there may be no urinary symptoms.

The treatment indicated is either dissection of the cyst away from the kidney tissue or removal of the cyst with a small wedge-shaped portion of the pole of the kidney. Nephrectomy should be performed only when the renal parenchyma has been destroyed by some condition such as a tumor, tuberculosis, or calculi.

C. TRAVERS SEPITA, M.D.

Morelli, M.: A Contribution to the Study of Hypernephroid Renal Tumors (Contributo allo studio dei tumori renali denominati ipernefroidi). *Arch. ital. di urol.*, 1931, vii, 303.

The author reports a study of six renal tumors—two true hypernephromata, three papillary adenocarcinomata, and one mixed tumor which was believed to have its origin from separate renal and suprarenal embryonic nests.

The papillary adenocarcinomata had a varied histological structure which the author attributes to development of the neoplasms from different parts of the primary kidney tubules. He is of the opinion that the tumors with tubules and papillary growths originated from the cells of the secretory tubules whereas the tumors with large clear cells were derived from the cells of the excretory or collecting tubules. Although these neoplasms are often classified as hypernephroid, Morelli believes they are of renal origin.

PETER A. ROST, M.D.

Lepoutre, C., and Dupas, L.: Duodenal Fistulae Following a Right Nephrectomy (Les fistules duodénales consécutives à la néphrectomie droite). *Arch. d. mal. d. reins et d. organes génito-urinaires*, 1931, v, 712.

Duodenal fistulae may follow injury of the duodenum during a difficult operation, denudation of the duodenum which reduces the vitality of its wall, pinching or the inclusion of a portion of the duodenal wall in a ligature, pressure on the duodenal wall by a drainage tube, or the extension of perirenal ulceration or inflammation to the duodenal wall.

The authors report a number of experiments carried out on animals with regard to the formation of duodenal fistulae. In every instance the fistula was produced by means of a drainage tube. The fistulae occurred in the first few days after operation and usually after removal of the drains.

The signs of the presence of a duodenal fistula are a variable amount of discharge, the presence of chyme and bile in the discharge, a peculiar odor, a red ulcerated appearance of the surrounding skin, and general symptoms such as vomiting, rapid loss of nutrition, toxæmia, and alkalosis.

In the authors' opinion, there should be no difficulty in differentiating between colonic, biliary, gastric, jejunal, and duodenal fistulae.

The prognosis of duodenal fistula is grave because of the patient's poor general condition and the danger of a secondary infection such as pneumonia. In a few instances spontaneous closure has occurred when the fistula was located in the peritoneal portion of the duodenum, but as a rule fistulae develop on the non-peritonized portion. Most operative procedures are unsuccessful.

The medical treatment should consist of measures to protect the skin around the fistula, frequent renewal of dressings, and abundant feeding to keep up nutrition.

The authors review a number of surgical procedures, but state that because of the patient's poor

general condition they usually limit their surgical treatment to jejunostomy. However, gastro-enterostomy with exclusion of the pylorus may be done if the general condition will permit it.

JAMES B. MASON, M.D.

Chauvin and Cerati: Primary Epithelial Tumors of the Ureter (Les tumeurs épithéliales primitives de l'urètre). *Arch. d. mal. d. reins et d. organes génito-urinaires*, 1931, v, 631.

This article is based on 108 cases of primary epithelial tumors of the ureter collected from the literature and 4 cases treated by the authors. The latter are reported in detail.

The incidence of the tumors was about the same in males and females. Ureteral stones as a possible cause were present in only 9 cases and leucoplakia was known to exist in only 2.

The papillomatous lesion was by far the most frequent. Non-pedunculated lesions, especially indurated malignant ulcerations of the ureteral walls, were rare. The tumors were generally single, but in 9 cases they were multiple. They occurred with about equal frequency in the right and left ureter. Their distribution in 82 cases was as follows:

	Cases
Upper third of ureter	14
Middle third of ureter	11
Lower third of ureter	25
Ureteral meatus	25
Meatus and neighboring structures	2
Diffuse	8

Metastases were found in the liver, lungs, pleura, and spine, but as a rule were local, limited, and not large. Within the ureter, the cells forming metastases were carried downward by the current of urine.

The histological types of the tumors were as follows:

	Cases
Benign papillomata	41
Papillary adenomata	3
Papillary epitheliomata	31
Pavement-cell epitheliomata	8
Malignant non-papillary tumors	20
Tumors of indeterminate type	9

The chief symptoms of a primary epithelial tumor of the ureter are hæmaturia, lumbar pain, and renal enlargement. The hæmaturia varies in amount and time of appearance and in other respects conforms to the classical neoplastic type of hæmorrhage. The pain may be colicky or dull and more or less constant as in hydronephrosis. The renal enlargement is due to hydronephrosis following ureteral obstruction, which in most cases occurs early.

Physical examination in the cases reviewed revealed little more than enlargement of the kidney. Occasionally a low tumor or its metastases could be palpated on vaginal or rectal examination.

Examination of the urine yielded no significant findings except hæmaturia.

One of the chief aids in the diagnosis was cystoscopy. In a third of the cases the tumor was un-

suspected until cystoscopic examination. Cystoscopy reveals a tumor protruding from the ureteral meatus or a change in the ureteral meatus or the ureteral ejaculation.

Ureteral catheterization was found to be a valuable adjunct to cystoscopy. It yielded evidence as to the level of the tumor and provoked the almost diagnostic sign of Chevassu and Mock—abundant bleeding following withdrawal of the catheter. It showed also the functional condition of the involved side.

Retrograde pyelography will disclose tumors that are not revealed by other methods.

The prognosis of tumor of the ureter is grave, even when the neoplasm is benign, and is especially unfavorable in cases of bilateral and malignant tumors.

Low ureteral tumors projecting from the ureteral meatus constituted a fourth of those reviewed and caused mainly vesical symptoms. Bilateral tumors were rare. Tumors of this type may grow very slowly. Cases have been reported in which they were present for from five to twenty-five years.

Diathermy is regarded as the treatment of choice for protruding and bilateral tumors, and one-stage nephro-ureterectomy for all others.

JAMES B. MASON, M.D.

BLADDER, URETHRA, AND PENIS

Oliveri, G.: The Filtrating Catheter (Il catetere filtrante). *Riforma med.*, 1931, xlvii, 55.

The author describes a method whereby chronic distention of the urinary bladder such as occurs in prostatism can be safely relieved. He inserts a retention catheter through the urethra into the bladder and closes the outer end of the catheter with a rubber or cork stopper through which he inserts a hypodermic needle. The bladder slowly empties itself through the lumen of the needle.

PETER A. ROSI, M.D.

Calef, C.: Treatment of Ruptures of the Posterior Urethra Complicated by Fracture of the Pelvis (Trattamento delle rotture dell'uretra posteriore complicate da frattura del bacino). *Arch. ital. di urol.*, 1931, vii, 416.

The results of treatment of traumatic lesions of the urethra, especially those of the posterior urethra, vary according to whether operation is performed immediately or is delayed. The author reviews six cases treated at the clinic at Perugia in which the lesion was produced by fracture of the pelvis or trauma to the perineum. He draws the following conclusions:

1. In rupture of the posterior urethra complicated by fracture of the pelvis, operation should be performed as soon as possible in order to prevent contamination of the fracture and avoid catheterization.

2. The primary intervention should be limited to suprapubic cystostomy as it is dangerous to subject

the patient who is already in a grave general condition to long and extensive operative procedures such as urethrorrhaphy.

4. After the injured tissues have healed, reconstruction of the urethral canal should be undertaken by means of circular urethrorrhaphy without the use of a permanent suture.

WILLIAM W. WHITELOCK, Ph.D.

Colby, F. H., and Smith, G. G.: Carcinoma of the Penis. *J. Urol.*, 1931, xxv, 461.

The authors report on fifty cases of carcinoma of the penis seen in private and hospital practice during the past ten years.

The cases are classified pathologically into two groups, those of Group 1 representing low malignancy and those of Group 2 representing high malignancy. All of the tumors were epidermoid carcinomata. The patients ranged in age from thirty-nine to ninety years. One-third were between forty and fifty years old. Half of them had had definite phimosis.

After operation, 10.5 per cent of the patients of Group 1 and 36.8 per cent of those of Group 2 died from cancer within the first year. Groin dissection was done in thirty-two cases. Malignant glands were found in 24 per cent of the cases of Group 1 and 62 per cent of those of Group 2. Of the patients subjected to groin dissection, 50 per cent of those in Group 1 and 70 per cent of those in Group 2 died from cancer. The authors believe that groin dissection should be a routine procedure except in cases in which the disease has been present only a short time.

ANDREW McNALLY, M.D.

GENITAL ORGANS

Warwick, W. T.: The Pathology and Treatment of Varicocele: A New Operative Procedure. *Lancet*, 1931, ccxx, 517.

The results of the injection treatment of varicose veins of the leg have suggested that the same method might be applicable to varicocele. The operative procedures used heretofore for varicocele have been generally unsatisfactory.

Investigations have shown that varicocele depends primarily on incompetence at the orifice of the spermatic vein which allows refluxes from the vena cava along that vein. In most cases of unilateral varicocele, which usually occurs on the left side, no cause of mechanical obstruction to the venous return is evident. Hence it appears that the force responsible for the varicose condition of the pampiniform plexus is not the vis-à-tergo of the blood stream, but the intra-abdominal pressure transmitted along the unvalved left spermatic vein. Anatomical investigation has shown that fairly often the posterior spermatic trunk has a valve near its termination, but lower down the other trunks often have competent valves. The valves are rendered useless because of the free communication between the trunks of the plexus, around which blood flows

downward with increased intra-abdominal pressure, forcing fluid into the pampiniform plexus. It is often possible to excise the channels which are not valved, leaving the pampiniform plexus protected by two or three valves. As the valved veins lie within the inguinal canal, they are adequately supported laterally during effort.

The author believes that injection is not the most logical method of treating varicocele as the amount of varicose plexus obliterated is less easily controlled by injection than by operation. He recommends the following operation:

The inguinal canal is opened and, by linear division of the cord coverings, the vas surrounded by venous trunks which terminate above in the single spermatic vein is exposed. These main trunks are

carefully defined from above downward. Valves appear as dilatations. The competence of a valve is proved by absence of reflux of blood downward after the segment of vein below has been emptied upward. The upper 2-in. portion of the trunks usually contains two or three valves. The unvalved routes are excised, a channel including a number of competent valves being left. The plexus is dissected down to the testicle and the greater part of its lower portion is removed, care being taken to see that the veins are clearly dissected before ligatures are applied to them. Ligation *en masse* is unnecessary and may include arterial and nerve elements.

The operation should be limited to veins. If no competent valves can be found, partial excision is indicated.

LOUIS NEUWELT, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Benassi: The Development and Nutrition of the Bones of the Extremities in Relation to Ligation of the Main Vessels (Lo sviluppo e trofismo dello scheletro degli arti in rapporto alla allacciatura dei vasi principali). *Arch. ital. di chir.*, 1931, xxviii, 49.

Before reporting his own investigations, the author reviews previous experimental studies of the effects of vessel ligation, especially ligation of the femoral and iliac vessels. He cites particularly ligations of the femoral artery and vein and the iliac artery performed by Bolognesi. It has been found that, in the dog, collateral circulation is rapidly established after ligation of the external iliac artery and of the femoral artery and vein. Ligation of the vein alone is more liable to cause pain and other disturbances in the limb. A large part of the collateral circulation develops by way of the gluteal vessels. After a time the ligated artery itself may become recanalized.

Benassi made a roentgen-ray and histological study of the effect of ligation of the external iliac artery and vein in rabbits. Both growing and adult rabbits were used. In one group, ligation of the iliac artery alone was done; in another group, ligation of the iliac vein alone; and in a third group, ligation of both the artery and the vein.

In twenty-one rabbits about a month old which were sacrificed from one day to three months after the ligation, no differences were noted in the nutrition or growth of the bones. However, in some of the animals which were sacrificed early, histological examination of the distal epiphysis of the femur disclosed oedema and capillary distention. In the twelve adult rabbits which were sacrificed from ten days to three months after the ligation, no changes were found.

KELLOGG SPEED, M.D.

González-Aguilar, J., and Busto, H. F.: The Calcium Content of the Blood, the Parathyroids, and Bone Disease (Calcemia, paratiroides y patología ósea). *Prog. de la clin.*, Madrid, 1931, xix, 3.

During the last four years the relationship between the calcium content of the blood, parathyroid function, and bone disease has been the subject of considerable study, particularly by Oppel and the Russian school and, from a different point of view, by Gold, Mandl, and American investigators.

Oppel concluded that the calcæmia of ankylosing polyarthritis is the result of a defensive parathyroid hyperfunction, and that the ankylosis is a mechanism of "auto-treatment" of the articular inflammatory process. In spite of the apparently favorable

results obtained from unilateral parathyroidectomy by various surgeons since Oppel's report, the authors believe that Oppel's theory can be accepted only with considerable reservation because, as Gold and others have pointed out, its basis is too empirical. In von Recklinghausen's disease the relationship between the blood calcium, parathyroid function, and bone disease appears to be much clearer.

The authors are inclined to interpret the calcæmia of ankylosing polyarthritis as Gold has done. According to their theory, the transitory calcæmia of polyarthritis deformans and polyarthritis ankylosans depends upon displacement of the bone substance itself, which occurs at certain stages of the pathological process, and not upon hyperparathyroidism. Hyperparathyroidism produces decalcification of the skeleton with a secondary calcæmia which gives rise, in its last stages, to von Recklinghausen's disease. Decalcification of the bone always increases the blood calcium. The reverse picture—that of progressive non-inflammatory ankylosis with multiple exostoses, muscular ossifications, and a decrease in the blood calcium—seems to be due to parathyroid hypofunction.

MARGUERITE P. SLOAN.

Bodansky, A., and Jaffe, H. L.: Parathormone Dosage and the Serum Calcium and Phosphorus in Experimental Chronic Hyperparathyroidism Leading to Osteitis Fibrosa. *J. Exper. Med.*, 1931, liii, 591.

Clinical osteitis fibrosa cystica (von Recklinghausen's disease) has been found to be associated with enlargement of the parathyroid glands. In experimental rickets and other conditions the enlargement of the parathyroids seems to be secondary but clinical evidence indicates that in von Recklinghausen's disease the hyperparathyroidism is primary.

In experiments on guinea pigs the authors were to induce a severe but non-fatal chronic hyperparathyroidism leading to osteitis fibrosa. Single injections of large doses of parathormone resulted not only in hyper calcæmia, but also in hyperphosphatæmia, which were most pronounced in young guinea pigs that had been fasted for sixty hours. Severe and extensive bone resorption with injury of the bone marrow occurred only in young guinea pigs. Prolonged treatment with parathormone resulted in varying degrees of bone resorption and marrow fibrosis. Toxic symptoms were absent even after the largest doses when the latter were preceded by smaller doses.

By a similar procedure, chronic hyperparathyroidism was produced in dogs, although the dog is very sensitive to moderate doses of parathormone.

The findings of the experiments are summarized as follows:

1. On a low calcium intake, hypercalcemia tended to disappear in chronic hyperparathyroidism produced by parathormone, apparently because of the reduction of a readily available calcium reserve.

2. A decrease in the blood calcium occurred in chronic hyperparathyroidism in young puppies on a low calcium diet. Tetany occurred at a calcium level which was higher and a phosphorus level which was lower than in tetany parathyreopriva of young puppies.

3. The serum phosphorus in chronic hyperparathyroidism in young puppies continued at or rose above the high level which is normal for young animals.

4. Early in the treatment and on a liberal calcium intake, a single dose of parathormone caused a more marked relative rise in the serum calcium than in normal adult dogs. The serum phosphorus rose after a single injection of parathormone even when there was no effect or only a slight effect on the serum calcium.

5. The continued effect of parathormone on the serum calcium after prolonged periods of treatment and the modified response of the serum phosphorus indicate tolerance due to compensation.

6. The bone lesions presenting the essential features of osteitis fibrosa cystica, which were of varying severity depending on the relation of the parathormone dose to the calcium intake and the duration of the treatment, were most prominent on a low calcium intake. Therefore it was possible to use large doses of parathormone without causing a fatal hypercalcemia or symptoms of overdosage.

ROBERT C. LONERGAN, M.D.

Matz, P. B.: A Study of Bone Tumors Among Ex-Service Men. *Radiology*, 1931, xvi, 664.

This report is based on a study of forty-five bone tumors occurring in ex-service men, 84.5 per cent of which were osteogenic sarcomata and 11.1 per cent of which were benign giant-cell tumors.

Ten of the neoplasms were of the spinal-cell type, eight of the mixed-cell type, and six of the giant-cell type.

Thirteen of the forty-five patients gave a definite history of trauma occurring from one to forty months before the appearance of the tumor. The majority of the tumors appeared less than one year after the trauma.

The average age of the forty-five patients was twenty-four and seven-tenths years, and the average age of the thirty-two who died was thirty-seven years.

The femur was involved in 46.7 per cent of the cases, the tibia in 24.5 per cent, and the humerus in 4.4 per cent. The lower end of the femur and the upper end of the tibia were the most frequent locations of the tumors.

Osteogenic sarcomata tend to invade normal tissues and to recur after excision.

Metastases were present in 55.6 per cent of the cases reviewed. Their incidence was highest (75 per cent) in the eight cases of sarcoma of the mixed-cell type.

Amputation was done in twenty-eight of the thirty-eight cases of osteogenic sarcoma and 17.8 per cent of the patients so treated are still alive. Amputation was done also in the five cases of benign giant-cell tumor and all of the patients are still alive. Two patients with osteogenic sarcoma who were treated with the roentgen-rays or radium alone are dead.

ELVEN J. BERKHEISER, M.D.

Coley, W. B.: Endothelial Myeloma or Ewing's Sarcoma. *Radiology*, 1931, xvi, 627.

In the majority of cases of bone sarcoma with recovery the tumor was an endothelial myeloma or Ewing sarcoma. As tumors of this type are very sensitive to irradiation and the toxins of erysipelas and bacillus prodigiosus, it is justifiable to try conservative treatment before amputation. As a rule the best treatment of primary operable cases of endothelioma of the long bones is systemic treatment with the toxins of erysipelas and bacillus prodigiosus combined with local irradiation, preferably with the radium pack. If marked improvement is not apparent after eight weeks, amputation or resection followed by prolonged prophylactic toxin treatment should be considered.

A large number of patients with inoperable tumors have recovered and remained well for five years or longer. As some of these patients had extensive metastases, the condition should not be considered hopeless until a thorough trial of toxin and radium treatment has proved unavailing.

ELVEN J. BERKHEISER, M.D.

Troell, A.: Sarcoma of the Long Bones, with Special Consideration of Its Treatment and of the Importance of Trauma in Its Etiology (Sarkom in den langen Roehrenknochen, mit besonderer Beruecksichtigung ihrer Behandlung unter Bedeutung des Traumas fuer die Geschwulstaetiologie). *Arch. f. Klin. Chir.*, 1930, clxiii, 199.

The author reports a study of seventy-seven cases of sarcoma of the long bones in which widely different methods of treatment were used. The best results were obtained in cases of diaphyseal tumors and the poorest results in cases of distal metaphyseal tumors.

The so-called peripheral sarcomata are more malignant than the central sarcomata. The greater the differentiation of the tumor cells the less malignant the tumor. However, as marked variations in histological structure may exist in different sections of the same tumor, a prognosis based on the tissue findings should be given only with reservations.

After invading a joint, para-articular sarcomata are arrested by the epiphyseal cartilage and must burrow their way under or through the capsule. The most important clinical sign is spontaneous fracture. Considerably less important are a blowing

sound on auscultation and parchment crepitation. The probable cause of the condition is shown best by the roentgenogram, which discloses the characteristic peculiarities of the giant-cell tumor. The rapidity of sedimentation of the red blood cells is most marked in the malignant forms.

Eighteen of the author's seventy-seven patients were treated conservatively. Of these, three were alive from twelve to twenty-seven years later. In the cases of two of the latter, the diagnosis was proved by histological examination. In the cases of eighteen other patients the treatment consisted of local curetting. One of these patients, who had a giant-cell tumor, could not be traced at the time of this study, seven died later of sarcoma, and three were still living from four to twenty-two years after the operation. In the cases of seven patients a more radical operation was done later. In the cases of twenty-five patients, including seven with a giant-cell tumor, resection was done and accompanied by transplantation of bone from the fibula or the crest of the ilium. Sixteen of these patients were alive and free from recurrence from four to twenty years later, two died of fat embolism at the time of operation, and six died from their sarcoma from three to fifteen months after the operation. In the cases of only four of the sixteen patients who survived were the functional results rendered unsatisfactory by fracture or resorption of the transplant. In the cases of twenty-three patients the neoplasm was removed *en masse* within its bony capsule. Among these were three patients with giant-cell tumors who remained free from recurrence. Eleven patients succumbed to their disease after from three months to four and a quarter years. Four could not be traced. Five have remained well for from three to eighteen years.

The conservative radical operation has a higher primary mortality than operations of the mutilating type, but gives better end-results.

A careful study was made of the relation of trauma to sarcoma. A history of trauma was given in thirty-one of the seventy-seven cases reviewed. However, only twenty-three of these are discussed as four were cases of giant-cell tumor and in four the neoplasm was not a sarcoma. Of the twenty-three cases of true sarcoma, the trauma agreed in time and location with the appearance of the tumor in only nine. Trauma does not cause sarcoma directly, but produces conditions resembling sarcoma such as ossifying periostitis, myositis ossificans, or osteitis fibrosa. The author cites four cases of this type which he treated and ten which he examined from the standpoint of compensation claims. In the differential diagnosis it is important to look for signs of bone destruction since if such signs are absent the condition is not sarcoma. If this precaution had been taken in two cases cited, needless resections would have been avoided. The author reviews also twelve cases of sarcoma "following trauma" which are recorded by the Swedish Reichsversicherungsamt. Compensation was granted in six.

In general the author is very skeptical regarding the traumatic origin of tumors. He believes that if trauma were an important factor the numerous injuries of the great war would have resulted in more cases of tumor formation. The assertion that trauma cannot be ruled out as a cause in an individual case is not tantamount to saying that trauma is a probable cause.

In conclusion the author again emphasizes the three factors which are necessary to prove a relationship of trauma to sarcoma: (1) a localized trauma to the bone involved by the sarcoma, (2) immediate local symptoms, and (3) a period of time between the occurrence of the trauma and the appearance of the tumor which is not too short or too long.

MAX BUDDÉ (Z).

Brizio, G. V., and Torrerì, T.: A Clinical and Roentgen Study of Cases of Gonorrheal Arthritis (Considerazioni clinico-radiologiche su alcuni casi di osteoartriti blenorragiche). *Poliedin.*, Rome, 1931, xxxviii, sez. med. 194.

The joints are involved in from 3 to 5 per cent of cases of gonorrhea. Predisposing causes of joint involvement are constitutional factors, pluriglandular insufficiency, and long-continued and exhausting diseases such as syphilis and tuberculosis. In a considerable number of cases there is a history of acute articular rheumatism, a condition which the authors believe favors the development of gonorrheal arthritis. The joint lesions may appear within three or four weeks after the infection or not until after a period of years. The literature reports a case in which it did not develop until thirty-two years after the primary infection and several cases in which it developed within two or three days.

The lesions vary from a simple hyperemia of the synovial membrane to destructive lesions of the osteomyelitic type. In the form associated with effusion, bone signs are at first lacking. Particularly in the serious forms in which ankylosis results quickly from destruction of the cartilage, nothing but a decrease in the width of the interarticular line may be noted. In other cases the joint line may be widened by the increased tension of the intra-articular fluid. A little later there is diffuse osteoporosis with greater transparency of the joint, blurring of the outlines of the bones, and acute decalcification as in any acute inflammation. This atrophy of the bone may precede destruction of the bone or develop later. An attenuated form of the subacute type is sometimes seen in which the bone appears to be made up of round cells the size of pinheads with a clearer middle part. These vacuoles along the edge of the bone are arranged regularly like a string of semi-transparent beads. They are seen much more frequently in the chronic than in the acute form. Other cases show the picture of periostitis presenting small lamellae parallel with the borders of the bone and rarefaction of the bone. A third group shows atrophy or rarefaction with cavities.

Various stages in the process have been described—diffuse osteoporosis in the acute stage followed first by the bead-like appearance and later by imperfect calcification and the formation of bone lamellae, hyperostosis, exostoses, pathological luxations, flattening, and synostosis. Common, though not pathognomonic, characteristics of gonorrheal joint disease are early blurring of the outlines of the epiphyses and a clear and spongy appearance due to decalcification. The latter is one of the chief findings differentiating the condition from tuberculosis, in which the foci of decalcification are scattered irregularly, and from syphilis, in which, when the diaphyses are not affected, constructive processes predominate over destructive processes.

In reporting seven cases of gonorrheal arthritis, the authors emphasize the great variety of the lesions and the fact that a definite diagnosis cannot be made from roentgenograms.

AUDREY G. MORGAN, M.D.

Burbank, R., and Christensen, B. E.: Specific Vaccine Treatment of 1,000 Cases of Chronic Arthritis, with Results and Clinical Observations. *J. Bone & Joint Surg.*, 1931, xiii, 246.

This report is based on 1,016 cases of chronic arthritis, in 726 of which the condition had been present for a period of two years or longer. Tuberculous, gonorrheal, and luetic arthritis are not considered.

The authors are of the opinion that chronic arthritis is due almost invariably to the streptococcus, but that in some cases amœbæ and the typhoid bacillus may play a part through their injury of the wall of the intestines. They believe that in most arthritides there must be a marked susceptibility to streptococcal infection or recovery would result without residual involvement of the joints.

During the chronic progressive stage of the disease an active joint may be the site of absorption and dissemination of the organisms. In every case, streptococci are present in the colon.

Joint enlargement due to circulatory inefficiency is practically painless and causes relatively little limitation of mobility. Pain is caused by an inflammatory process rather than bony overgrowth.

In the authors' cases of chronic arthritis the complete history is taken, the joints are examined, and a thorough search is made for foci of infection. Cultures are obtained routinely from the teeth, gums, throat, upper nares, and the stools and from any other suspected focus. At the same time from 6 to 8 c. cm. of blood are taken and used for complement fixations with about 30 strains of streptococci obtained, when possible, from proved foci of infection in arthritic patients. This obviates the scarifications necessary in the skin test and makes it possible to gauge the amount of complement required by titration.

The diet is then regulated. Sweets and pure starches are restricted as they seem to favor the

growth of intestinal streptococci. As a rule meat is also restricted to some extent. As it is desirable to prevent the extraction of calcium, fruits and vegetables containing oxalic acid are eliminated from the diet despite the fact that most of them contain vitamins. As a rule an attempt is made to implant the bacillus acidophilus. Orthopedic treatment is advised, and physical therapy is used if it gives relief. The autogenous vaccine is given once a week by intramuscular injection. In toxic cases an initial dose of 5,000 organisms is given. If a reaction follows, the dose is cut down to 500 organisms. In the less toxic cases from 50,000 to 500,000 organisms are given in the first injection. As the complement fixations are negative after successful treatment, the authors believe the vaccine is specific.

The vaccine injections are continued at intervals of a week until the patient is practically free from symptoms. The intervals are then gradually lengthened as much as possible. Marked improvement is seldom apparent until after from 4 to 6 injections have been given.

The article contains tables showing the results in severe, moderately severe, and mild cases in relation to various foci of infection, the clinical and serological classification of the causative organisms, the ages of the patients, and the duration and severity of the disease.

Seven and five-tenths of the patients were in a worse condition after the treatment or were not benefited by it, 10.7 per cent were slightly benefited, 8.5 per cent were moderately benefited, 56.6 per cent were very markedly benefited, and 16.7 were entirely relieved of their symptoms.

In 465 cases the tonsils had been removed when the patient was first seen, but in spite of the large number of tonsillectomies, 521 patients had definite throat infection. The authors believe that removal of the tonsils should rarely be done in active cases of arthritis until a series of vaccine injections have been given to prevent an exacerbation following the tonsillectomy. Two weeks after the operation the injections should be resumed.

As a rule an infected tooth may be removed at any time because tooth extraction is a comparatively simple procedure.

All possible methods should be used to increase the patient's strength. Arthritis is a systemic disease, but can be relieved and controlled more completely than most chronic conditions.

ROBERT V. FUNSTON, M.D.

Alajouanine, T., and Gopcevitch, M.: The Semiology of Muscular Hypotonia. The Syndrome of Static Hypotonia (Sur la sémiologie de l'hypotonie musculaire. Les syndromes d'hypotonie statique). *Presse méd.*, Par., 1931, xxxix, 562.

Muscular hypotonia is a symptom of varying importance frequently observed in the course of disturbances of the nervous system. To find the signs of hypotonia during rest the patient is examined in dorsal decubitus or the sitting position. Informa-

tion is furnished by morphological changes in the muscular masses, changes in the consistency of the muscles, and changes in the reflex muscular resistance revealed by passive mobilization. The sign most often sought is passive shaking of the distal segment of a limb, hand, or foot.

Foix and Thévenard have published clinical studies of muscular action in static hypotonia. Their findings demonstrate that the study of static hypotonia must include, on the one hand, the tonus of attitude and, on the other hand, the reflex of attitude showing the muscular synergies of equilibration. A study of the muscular synergies of equilibration must include spontaneous equilibration and provoked disequilibrium. The latter is tested by a push against the sternum, a push causing the subject to move a foot, voluntary lateral flexion of the trunk, and the squatting position.

In sciatic neuralgia and neuritis, hypotonia is evident in the region of the affected nerve. In sciatic neuralgia, hypotonia is of particular importance as it is the only objective sign. In certain rebellious neuralgias of long standing as well as in neuritic or radicular attacks of the sciatic more marked changes of attitude may be observed. Very often there is a scoliosis with its convexity toward the affected side. This is Brissaud's crossed sciatic scoliosis.

Unilateral hypotonia is observed also in the course of certain cerebellar syndromes. In subjects presenting a peripheral vestibular syndrome with changes in the instrumental vestibular reactions slight or marked hypotonia may be found. In certain vestibular syndromes apparently due to a central disturbance of the vestibular apparatus there is static hypotonia. Pyramidal lesions are accompanied by hypotonia.

Usually in the clearest cases, such as those of tabes, both quadriceps muscles are permanently contracted and the patellæ are fixed. As a rule the intensity of the contraction is more marked on the less hypotonic side. This is true in the ankle and the muscles of the posterior side. In some cases, however, the muscles of the posterior surface of the thigh on the more hypotonic side may appear abnormally contracted. This abnormal tonicity seems to be explained by the associated genu recurvatum. When the hypotonia is accompanied by disturbances of deep sensibility the equilibrium is disturbed.

Whenever there is hypotonia the equilibrium of segmental suspension is changed and a syndrome of static hypotonia results. In unilateral hypotonia the lower limb of the hypotonic side presents a diminished tonic function. This results in an involuntary haunched attitude which decreases equilibration activity. In bilateral hypotonia, in which the condition is usually more marked on one side than on the other, there is usually, in addition to the haunched attitude, a contraction of both quadriceps, which seems to correspond to a change in the attitude of the vertebral column (lumbar lordosis) and the resulting change in the attitude of the pelvis.

PAGE

King, E. S. J.: Concerning the Pathology of Tumors of Tendon Sheaths. *Brit. J. Surg.*, 1931, xviii, 594.

Tendon-sheath tumors are insidious in their onset. They seldom cause pain. The most constant sign is a swelling in the region of a tendon, most frequently in the hand. This may reach the size of a small orange before treatment is sought. It may be localized or extend along the tendon. As a rule the tumor grows slowly. Trauma is an important factor. Tendon-sheath tumors are usually round and frequently are lobulated. They have a smooth surface. If they occur in a joint or invade it, they may cause a disturbance of function. The majority are benign, but a few are malignant. When the skin is involved by the tumor it becomes bluish and finally breaks down and fungates. Tendon-sheath tumors are reddish-yellow, yellow, or gray. They may involve the tendon sheath for a considerable portion of its length on one aspect or may completely surround the tendon. Sometimes they are attached to the tendon sheath by a narrow pedicle.

Their consistency varies with their nature, a very cellular growth being soft and a growth with an admixture of fibrous tissue being firmer. Sometimes they are of a fatty character.

Angiomata and lymphangio-endotheliomata have been reported.

Microscopic examination shows that the benign tumors consist of spindle and spheroidal cells in variable proportions. In some of the neoplasms—xanthomata and giant-cell tumors—there are foam cells. Giant cells of the foreign body type may be present in considerable numbers. Bone, cartilage, and mucoid connective tissue may be found in some of the tumors. Throughout all of them definite spaces occur among the cells. In the malignant types the cell structure is more irregular and embryonic.

In discussing the normal histology of the synovial membrane the author states that this membrane consists of a specialized free connective tissue surface. The cells are of a modified connective tissue type. Key has pointed out that the cells are of the same form in all parts of the joint, but that the underlying tissue is different in different portions, being areolar, fibrous, or adipose. The villi which occur in tumors are usually much more cellular than other portions and are very vascular. They correspond in structure to the portion of tissue from which they arise. Near the cartilaginous border the synovial cells show a gradual transition through pseudocartilage to true cartilage.

As the tumors under discussion arise from the sheaths of tendons, a knowledge of the normal histology of the tendon sheaths is essential. Not much is known regarding the structure of the tendon sheaths except that it is similar to that of the lining of joints and bursæ. The specialized cells of the synovial membrane form a surface for the tissue surrounding the synovial space. In a similar manner, the cells of the tumor form the lining spaces

which occur throughout the growth. This is a characteristic of tendon-sheath tumors which has been overlooked. The spindle and spheroidal cells of the tumor merge with each other and apparently proliferate with the formation of spaces which are comparable to synovial cavities.

The author suggests calling tumors developing in tendon sheaths "tenosynoviomata" and classifying them as follows:

1. Benign: (1) fibrous, (2) cartilaginous, (3) fatty (4) vascular, (5) osseous, and (6) mixed.

2. Malignant.

The relationship of tendon-sheath tumors to ganglia is another problem. Both of these formations occur in identical areas and it appears that a ganglion may arise as a tumor which has undergone mucoid degeneration.

Definite inflammatory conditions, such as tenosynovitis, are not discussed in this article. Dunn has suggested that doubtful tumors are on the borderline between inflammation and new growth.

ROBERT C. LONERGAN, M.D.

Satanowsky, S.: *General Considerations Based on Forty Cases of Scoliosis* (Consideraciones generales sobre 40 casos de escoliosis). *Semana méd.*, 1931, xxviii, 197, 305, 363.

This article is based on forty cases of scoliosis seen by the author since 1923. In some of the cases the course of the condition was followed during the seven-year period.

True scoliosis is the result of a pathological alteration of the spinal column. It never occurs in a normal spine. As the anatomical arrangement of the normal spine is the same as that observed in certain types of scoliosis, scoliosis has been considered by some as an exaggeration of the normal condition. Confusion of true scoliosis with a posture assumed by certain children, a functional scoliosis, has led to incorrect statistics.

In a rather detailed discussion of the symptoms and diagnosis of the congenital and acquired types of scoliosis, the author emphasizes the importance of a thorough general examination and roentgen examination. He says that the spine should be roentgenographed from various positions and from the same positions at various times during the treatment. The roentgenogram will reveal numerical variations and congenital and acquired deformities of the vertebrae and ribs and destructive lesions of the vertebral bodies. Scoliosis is not usually detected in its incipency, but is now diagnosed much earlier than formerly.

The causes of scoliosis may be divided into two groups: (1) changes in skeletal resistance, and (2) changes in equilibrium due to alterations in the soft parts or the skeleton. Among those of the first group are rickets and osteomalacia. Those of the second group include flaccid and spastic paralysis of the trunk and extremities, retraction of half of the thorax due to purulent pleurisy, and changes of equilibrium produced by a congenital or acquired

change in the vertebrae, the pelvis, or the lower extremities.

The author discusses the various theories regarding the etiology of scoliosis which have been recorded in the literature. The vertebral epiphysitis described by Sorrel and Delahaye was not found in any of his cases of adolescent scoliosis, but was present in a case of kyphoscoliosis. With regard to the theory that rickets is the cause of all cases of scoliosis, Satanowsky says that a rachitic deformity of one or several vertebrae could hardly pass unobserved during a number of years and then become apparent in adolescence. In his twenty-two cases of essential scoliosis he found no indications of infantile rickets nor of any type of glandular insufficiency. Jansen has summarized the causes of rickets as: (1) undernutrition, (2) intoxications, and (3) the harmful influence of poor living conditions. To these, Satanowsky adds chronic infections. He believes that these factors favor scoliosis as well as rickets. Paralysis of the muscles of the trunk and extremities may cause scoliosis by producing disbalance of the spine. In three cases seen by the author there was palsy of the brachial plexus of obstetrical origin. With regard to essential scoliosis it is generally agreed that the primary condition is a lesion of the bone which is acted upon by other factors such as muscular contraction and vicious attitude.

The author divides the evolution of scoliosis into three stages: (1) the beginning of the deforming process, (2) further progress of the deforming process with the appearance of deformity, and (3) arrest of the deforming process after development of the deformity. In the first stage, bone lesions must be present. There is roentgenographic evidence, but no anatomical evidence of changes in the form of the intervertebral disks. In the second stage there are morphological changes in the vertebrae corresponding to the new conditions of balance. The final deformity is evidenced by a more or less marked deviation of the spine with a corresponding effect on the thoracic cage. Except in the rachitic type, there is seldom any accompanying deformity of the pelvis. In congenital scoliosis the malformations most frequently observed are one or two hemivertebrae. These may be due to aplasia of a vertebral body or the formation of a supernumerary vertebra. When the scoliosis is manifested late, as in many of the author's cases, the presence of a fifth asymmetrical lumbar vertebra does not prove that the condition has been present since birth. The author has had seven cases showing this asymmetry. In one, there was a severe rachitic scoliosis with a generalized vertebral deformity which began at the age of five years. In two, a lumbar scoliosis began at the ages of ten and fourteen years respectively. In four, there was a typical essential scoliosis beginning late.

With regard to the pathogenesis of the vertebral deviations in scoliosis, the author accepts the findings of Menard and Guibal, Schulthess, Schanz, and

Monod and Lovett. Because of the changes in the structure of the vertebrae which are observed in certain cases of rachitic and essential scoliosis, and because of the deformities produced by mechanical alterations, he believes it logical to assume that the deviation is the result of muscular weakness at the level of the affected vertebral segment which is produced in the same way as the muscular contractures and atrophies in osteo-articular inflammatory processes.

The prognosis of the scoliotic attitude and of static scoliosis is favorable. However, the scoliotic attitude may evolve into true scoliosis. The prognosis with regard to the results obtainable by treatment varies according to the degree and cause of the deformity.

The treatment indicated depends upon the cause. If, as the author maintains, essential scoliosis is due to abnormal malleability of the vertebrae and the muscular insufficiency is secondary, the objects of treatment should be: (1) to prevent fatigue and the deforming action of muscular contraction, and (2) to remove the cause, if possible, or, if this is impossible, to strengthen the organism by the use of chemical or physical agents having an elective action on the bony system. For the prevention of fatigue, prolonged rest in bed is indicated, but the continued extension which is advised by Gauthier seems unnecessary. To strengthen the muscular system, the author recommends general massage of short duration. During the period in which the deforming process predominates, exercises are contra-indicated.

When a case of incipient scoliosis shows a tendency toward exacerbation in spite of well-planned treatment, the patient should be subjected to continued extension on an inclined plane for several months. At the end of that time he may be permitted to get up for gradually increasing periods of time, beginning with a few hours a day. When scoliosis is treated during the incipient period; recovery often occurs without deformity, but the majority of cases are not seen until the second or third stage of the condition. When the patient is first seen with the deformity established and partially reducible after the deforming stage of the disease has passed, the treatment should be directed toward modifying the deformity and preventing its progression. In this stage, progression of the deformity may occur independently of the deforming process as the result of mechanical changes in the growth of the vertebrae. The muscular disbalance may be modified by active exercise with or without apparatus and by passive movements and mechanotherapy. Of the asymmetrical corrective movements, the author recommends especially those described by Roederer and Klapp. Some patients regain muscular equilibrium in a short time. Exercises cannot correct a vertebral deviation; their only object is to strengthen the muscular system.

For the reduction of the vertebral rotation and the costal gibbus, passive mobilization has proved

ineffective. The immediate results of straightening the spine and immobilizing the patient in plaster were encouraging, but a recurrence soon developed. Abbott's method accomplishes correction, but was responsible for a fatal outcome in cases reported by the author. However, the principles on which this method is based may be applied to scoliosis of the first and second grades by more exact and less violent methods. The author has used the Estor method for all patients with scoliosis of the second grade. In the two cases in which the treatment was continued for several years, the aesthetic and functional results were entirely satisfactory. In all of the cases appreciable improvement was obtained; the gibbus became less pronounced or disappeared, the shoulders became level, and the axis of the thorax resumed its median position. Satanowsky has not used Haglund's procedure, but believes it is indicated in lumbar scoliosis with a single curve. In this condition he has found Volkman's inclined chair of value.

In fixed scoliosis, which cannot be reduced by the procedures described, surgical treatment has been tried. The objection to operations on the muscles and tendons is that after removal of the cast immobilizing the portion operated upon the deviation may recur because of lack of support of the spine. Frey's procedure—resection of ribs on both sides—is objectionable because it deprives the dorsal column of its only support. The author condemns also operations intended to utilize the corrective strength of the spine by acting directly or indirectly on the vertebral bodies.

To arrest the progress of a deformity which is not susceptible to improvement by conservative means and to prevent exacerbation in progressive or paralytic scoliosis, the Albee and Hibbs procedures have been proposed. These operations have only limited indications in essential scoliosis.

A number of types of corsets have been suggested for the correction of scoliosis, but corsets are not effective and may cause atrophy of the dorsal muscles.

Congenital scoliosis should be treated by corrective measures similar to those used in essential scoliosis of the first and second grades. Rachitic scoliosis requires special treatment in the first and second stages. Patients with scoliosis of this type should remain in a plaster cast in hyperlordosis or the ventral position (preferably the latter) until the rickets is cured. When the deformity is already established, fatigue, exercises, and straightening procedures should be avoided, the patient should be subjected to prolonged continuous extension on an inclined plane, and massage and general anti-rachitic treatment should be given. During convalescence a corset should be applied.

In paralytic scoliosis, grave deformities may be prevented by the use of a corset, but if no hope can be held out for regeneration of the paralyzed muscles after massage and re-education, surgical treatment is justified.

MARGUERITE P. SLOAN.

Mouchet, A., and Roederer, C.: Spondylolisthesis (Le spondylolisthésis). *Presse méd.*, Par., 1931, xxxix, 569.

Spondylolisthesis is the slipping forward of the fifth lumbar vertebra on the body of the first sacral vertebra. It occurs most frequently between the twentieth and twenty-fifth years of age and is more common in females than in males. In the typical case, lordosis, sometimes so marked that the floating ribs are in contact with the iliac crest, has been present since an early age. The premonitory signs of spondylolisthesis are a change of attitude and vague pains in the lumbar region. The signs of established spondylolisthesis are a low lordosis, shortness of the trunk which tends to telescope into the pelvis, a peculiar gait, stiffness, serious nervous disturbances (resistant neuralgias), and sometimes a scoliosis and deformity of the pelvis. The slipping of the body of the fifth lumbar vertebra onto the first sacral can be seen in a lateral roentgenogram.

The pain makes certain positions, especially sitting, insupportable. It is often relieved by the recumbent position with the thighs flexed on the abdomen and the upper part of the back raised by a pillow. Pressure on the spinous process of the fifth lumbar vertebra is often painful, but the pain so produced is less severe than that caused by pressure on the lateral processes. Shocks, coughing, and sneezing do not cause pain as they do in Pott's disease. When the patient is suffering, contractures develop which result in pain in the lumbar region. The pains are usually localized more definitely in the lumbosacral region than those caused by other conditions in the same region. The relatively local character of the pain, the absence of muscular atrophy, the trophic disturbances, the change in the reflexes, and the rarity of distant referred pains show that the condition is not due to nerve compression at the vertebral foramina. In the authors' opinion, the principal cause of the pain is articular. As the result of distention of the capsules or ligaments, phenomena of arthritis are probably produced in the fourth and fifth articulations and the arthritis causes reflex antalgic contractures of the muscles that pull on the ligaments. In this way a vicious circle is established, which is broken only by prolonged rest.

Two roentgenograms should be made of the fifth lumbar vertebra—one with the subject in the natural recumbent position, and one with the subject in the special position with the pelvis raised. In the early stages the difference in height of the fifth lumbar vertebra as seen from in front may attract attention. The space between the fifth lumbar and the first sacral vertebra has completely disappeared and the point of the spinous process of the fifth lumbar seems to be slightly raised. The transverse processes may appear longer and flatter than normal. In the lateral view the overhang of the fifth lumbar vertebra is more or less clear. The sacrum may be normal, narrow, tapering, flat, or arched.

When spondylolisthesis is more marked, the fifth lumbar vertebra as seen from in front is not so

high as the neighboring vertebrae and its lower edge forms a line concentric to the upper edge, which it follows more or less closely. Between the two lines the upper edge of the sacrum is seen. The erection of the spinous process of the fifth lumbar vertebra is more marked. In the lateral view it is common to see a sort of shelf coming from the superior region of the first sacral vertebra, which acts as a support for the fifth vertebra. The cause of this osteophytic formation is a periosteal reaction around the common vertebral ligament.

When the spondylolisthesis is very marked, the anterior view no longer shows the anterior surface of the vertebra, but discloses its upper surface. A transverse line cutting the foramen into two unequal parts is the base of the sacrum.

Slight slipping of the body of the fifth lumbar vertebra onto the sacrum is common. The fifth lumbar vertebra is so frequently abnormal that its normal position is not exactly known. There are many states of prespondylolisthesis and spondylolisthesis which remain for a long time in the quiescent state.

In discussing the mechanism of spondylolisthesis, the authors state that the condition is due to: (1) slipping or unhooking of the fifth lumbar vertebra or (2) elongation of its middle portion. The elongation is due to a congenital anomaly.

None of the treatments proposed for fully developed spondylolisthesis is satisfactory. If the condition is recognized in the primary stage, rest in dorsal decubitus or holting of the spinous processes by an Albee graft may prevent the slipping of the lumbar vertebra in front of the sacrum. PAGE.

Suermont: The Treatment of Coccygodynia (Die Behandlung der Coccygodynie). *55 Tag. d. deutsch. Ges. f. Chir.*, Berlin, 1931.

The coccygeal pain discussed by the author occurs almost exclusively in women. It is an extremely severe neuralgia of the nerve plexus which winds about on each side of the coccyx. It may be caused by pathological processes in the coccyx, such as fractures, dislocations, and osteomyelitis, but in some cases it apparently occurs spontaneously. All internal remedies fail. Some neurologists regard the condition as a kind of vaginismus and accordingly recommend psychoanalysis. This may help in some cases. By others, resection of the coccyx is advised. This is done best under local anesthesia and through a transverse incision. The author has relieved the pain by epidural injections of novocain. He has treated ten cases in this manner—five of traumatic origin and five in which the condition was idiopathic. Forty cubic centimeters of a 1 per cent solution of novocain were injected into the sacral canal. Except for transitory dizziness and slight paresis of brief duration, there were no complications. The procedure can be carried out as ambulatory treatment, but the patient should lie down for a few hours after the injection. In some cases one injection was sufficient, but in 3 per cent

a number were necessary (up to twelve in cases of long standing). The effect is explained by the degenerative influence of the novocain on the nerves, which has been noted also after endoneural injections.

In the discussion of this report, Erb stated that, in Laewen's clinic also, coccygodynia is treated by the induction of sacral anaesthesia and is frequently so treated in the ambulatory clinic. In two indisputable cases treated in the Koenigsberg surgical polyclinic in the last few years, Erb was able to confirm Suermont's observations with regard to the effectiveness of epidural injections on coccygodynia of traumatic origin. He stated that sometimes from four to six injections are necessary. According to Laewen, 30 c.cm. of a 1 per cent tutocain solution should be injected. It is probable that the injection induces a hyperæmia.

ALEXANDER reported that massage, particularly vibration massage, carried out from the rectum or vagina is frequently beneficial, even in severe coccygodynia. He stated also that a thorough vaginal examination and careful palpation will often reveal a hæmatoma, which is of great importance in the determination of accident compensation.

STETTNER (Z).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Campbell, W. C.: *The Physiology of Arthroplasty.*
J. Bone & Joint Surg., 1931, xiii, 223.

Campbell states that experiments on animals are of only slight value in solving the problems of arthroplasty.

In joints in which satisfactory function has been secured by arthroplasty the external contour is changed. Active motion is usually commensurate with passive motion. In some joints there may be slight motion in an abnormal direction. In joints which do not bear weight, normal motion is not unusual, whereas in weight-bearing joints the most satisfactory result is only about 60 per cent of normal motion.

Four cases of spontaneous arthroplasty in which a part or all of the normal motion of the joint was recovered are cited by the author. Sections made at operation in some of them disclosed a superficial layer of dense fibrous connective tissue and beneath this a layer of fibrocartilage. The cartilage showed definite degenerative changes. The cancellous bone beneath the cartilage was normal.

The author reports his findings in 6 joints which were incised after an arthroplasty that had resulted in a practical range of motion. In a case in which the second operation was done because of instability seventeen months after the arthroplasty there was a definite joint cavity about two-thirds the normal size which was covered by a fibrous membrane. In all of the cases the membrane was thin and a layer of cartilage was apparently present at the points of greatest pressure. Microscopic examination showed

the articular surface to be covered, except in certain areas, by a dense fibrous tissue. The fibrous layer was continuous with the underlying stratum. The latter was about 3 times as thick as the fibrous layer and closely resembled fibrocartilaginous tissue. Beneath it there was cancellous bone. On high magnification, the superficial layer was found to be composed of dense fibrous connective tissue with flat nuclei. This tissue merged with the cartilaginous layer beneath. There was no true cartilage matrix. Sections from the capsule demonstrated only fibrous tissue.

Much information can be obtained from successive roentgenograms after arthroplasty. The author has studied about 200 roentgenograms made after intervals ranging from one to ten years. The findings varied according to the function of the joint. In the majority of the joints the articular surfaces were smooth. In a small number of knees there was a punched-out area on the lateral aspect of the articular surfaces of the femur which corresponded to the normal external condyle. Successive roentgenograms demonstrated that compression of the articular surfaces was due to functional use before the structure of the bone had been sufficiently restored.

Pronounced bone proliferation evidenced by an outgrowth from the articular margins was present in approximately 40 per cent of the joints. This reaction depends entirely on the extent and the degree of involvement of the bone by a pyogenic process. In cases in which the infection was confined to the joint and the structures of the bone had remained normal there was no reaction.

On incision into the joint the skin and the superficial and deep fascia are found normal. At the end of a year the joint capsule may be much thicker than normal. The fluid probably arises from connective tissue spaces of the articular surfaces. The space between the articular surfaces is usually less than normal in the weight-bearing joint and approximately normal in joints which do not bear weight.

The stamina of the contour of the articular surfaces, as shown by the gross irregularities observed in the roentgenogram, is determined by the circulation which controls normal bone repair. The articular extremities being free, the blood supply is derived solely from the attachment of the adjacent soft structures. The gross irregularities are not always incompatible with excellent function. The tissue structure of a joint restored by arthroplasty, as demonstrated by microscopic examination, is almost identical with that of a joint which has undergone spontaneous arthroplasty, destruction by a pathological process, or pseudarthrosis. In such joints there are 3 more or less well-defined strata—a dense fibrous layer, a layer of atypical cartilage, and the supporting bone.

In the author's method of arthroplasty, a double layer of fascia lata is interposed between the articular surfaces, the primitive embryological joint being thus reproduced as nearly as possible. As a dense

fibrous investment is formed in spontaneous arthroplasties and pseudarthrosis, in which no tissue is interposed, the rôle of the fascia lata is not known. Whether the fascia lata lives and acts as a permanent investing membrane or as a scaffold or, as Baer suggests, becomes encysted as a foreign body, is a question to be answered by the physiologist and histologist. However, experience has proved that it possesses a definite action conducive to the development of a joint.

The general principles of arthroplasty are: (1) plastic adjustment of the soft tissues, (2) reconstruction of the bones, and (3) the interposition of some material between the articular surfaces.

ROBERT V. FUNSTON, M.D.

Kornev, P.: The Importance of Conservative Resections in the Treatment of Tuberculous Affections of the Knee and Their Sequelæ (Bedeutung der sparsamen Resektionen in der Behandlung der tuberculösen Kniegelenksaffektionen und deren Folgezuständen) *Vestnik. Chir.*, 1930, lvi/lvii, 265.

In the course of eight years 200 cases of tuberculosis of the knee joint have been treated in the author's clinic. By conservative treatment alone it was possible to obtain a lasting true cure with restoration of function only rarely. After apparent healing and the resumption of heavy labor in cases so treated there was usually a recurrence which, as a rule, ran an unfavorable course. The author is now of the opinion that the treatment should be a combination of conservative and operative procedures. When possible, conservative procedures should be used in the active stage of the disease. If they arrest the disease process and there is normal configuration of the joint with good mobility, operative treatment will not be necessary. As a rule, however, there remains a painful rigidity with a certain amount of subluxation that can be relieved only by operation. In such cases, in which the process has become quiescent, extensive resections are not necessary. On the basis of 60 cases in which he performed a conservative resection the author recommends the following technique:

Textor's curved incision is made, the patellar ligament is resected without opening the joint, and the patella is sawed through in the frontal plane. The anterior normal portion of the patella is then turned upward with the patellar ligament and the tendon of the quadriceps. The upper recess, including its posterior wall, is curetted as far as the joint cartilage, and the distal, tuberculous half of the epiphysis is sawed off in a curved direction with the convexity downward, care being taken not to injure the epiphyseal cartilage of the femur. The posterior recess is then curetted and the proximal half of the tibial epiphysis above the epiphyseal cartilage is removed with the saw. In this way the entire diseased joint is extirpated entirely or largely extracapsularly and the curved sawed surfaces of the femur and tibia may be brought together with

correction of the subluxation. The preserved anterior half of the patella is fastened to the epiphysis of the tibia so that adhesion between the tibia and femur is favored and subsequent bowing is prevented. A plaster dressing is then applied and left on for six weeks. Attempts at walking are allowed after eight weeks, and a splint is worn for from one to one and a half years. During the time the splint is worn the bones unite in proper alignment. In cases in which, after the sawing through of the bone, necrotic areas extending deeply into the bone and perforating the cartilage of the epiphyseal line are seen, these areas are curetted and the resulting cavities filled with a soft iodoform-vaseline plug.

Of the 60 patients operated upon in this manner, only 32 could be traced. Of the latter, 11 were operated upon more than three years ago (up to seven years); 9, from two to three years ago; 10, from one to two years ago; and 2, from ten to twelve months ago. Two of the 32 patients traced died after from one and a half to two years, 1 as the result of an accident and the other of peritoneal tuberculosis. Of the 30 patients still living, 29 were able to be about and were free from pain.

Before the operation the involved limb showed an average shortening of 3 cm. After the operation the average shortening was 4 cm. at first and 5 cm. later.

In Kornev's opinion, conservative resection is indicated chiefly in cases of tuberculosis of the knee joint in which, following properly conducted conservative treatment, the process is arrested but the deformity persists and movement is still somewhat painful. In such cases extensive resections are not necessary since the more conservative operation will give the desired result and even in children does not produce too great shortening. The majority of the author's patients were between ten and twenty years of age.

N. PETROV (Z).

FRACTURES AND DISLOCATIONS

Hosford, J. P.: The Use of Local Anæsthesia in the Treatment of Fractures, with Conclusions Drawn from Fifty Cases. *Brit. J. Surg.*, 1931, xviii, 546.

Local anæsthesia for the reduction of fractures may be induced by: (1) injecting 10 c.cm. of a 2 per cent solution of novocain directly into the hæmatoma after the method of Boehler, (2) infiltrating the anæsthetic around the fracture area, (3) blocking the peripheral nerves, (4) injecting the brachial plexus (for fractures of the upper extremity), or (5) inducing spinal anæsthesia.

In the cases of patients of advanced age who are severely shocked and in cases in which general anæsthesia is contra-indicated, local anæsthesia permits earlier reduction of the fracture. After the reduction the patient can demonstrate the range of motion obtained. Transportation is more comfortable after infiltration of the anæsthetic and proper splinting. The limb may be subjected to roentgen-ray examination immediately after the re-

duction and the position corrected if the reduction is unsatisfactory. The fracture may be reduced without the aid of an assistant. Local anaesthesia is most advantageous for reduction under fluoroscopic control.

In the cases of very young children and in cases of compound fracture local anaesthesia is contra-indicated, but plexus block and spinal anaesthesia may be employed safely. When roentgen apparatus is not available, the reduction should be made under general anaesthesia.

The author reviews fifty cases of fractures of the long bones in which reduction was effected under local anaesthesia with excellent results. In only one case was the infiltration unsuccessful. In this instance there was no displacement, but the oedema made it difficult to locate the fragments with the needle. In no case has the infiltration been followed by infection.

RUDOLPH S. REICH, M.D.

Berg, R. M., and Kugelmass, I. N.: Calcification in Callus Formation and Fracture Repair. *Ann. Surg.*, 1931, xciii, 1009.

Bone repair at the site of a fracture is produced by the infiltration of blood clot, retraction of fibrin, and invasion by fibroblasts which are converted into osteoblasts with the formation of a fibrin callus. There is a vasomotor vascularization resulting in absorption of the bone ends and preparing the fragments for normal bone union.

When union of fragments requires longer than the usual time, the healing is regarded as delayed, but when exudate supervenes about the fragments, further osteogenesis ceases and non-union is inevitable. Delayed union may result from chemical or mechanical causes.

In fractures produced in animals experimentally, the greater the amount of fibrous tissue formation the greater the amount and degree of calcification. The dissolution of fibrous tissue by an alkaline trypsin solution diminished the quantity and rate of bone repair. The injection of tissue fibrinogen at the site of the fracture stimulated fibrous tissue production and increased the amount and rate of bone repair.

RUDOLPH S. REICH, M.D.

Lucchese, G.: Two Cases of Fracture of the Axis Without Nerve Symptoms (Due casi di frattura dell'epistrofeo senza sintomi nervosi). *Chir. d. organi di movimento*, 1931, xv, 481.

Attention is called to the fact that fractures and other severe injuries of the cervical vertebrae are often diagnosed as contusions and sprains because of the absence of nerve symptoms.

The first case reported by Lucchese was that of a man forty-one years old who fell from a pole about 10 meters high, lost consciousness for a while, and ten days later entered the hospital with bronchopneumonia, a fracture of the right clavicle, and severe pain in the nuchal region which was increased by all movements of the head. The head was thrust forward with the chin lowered and approximated to

the sternum. The left sternocleidomastoid muscle was contracted. Flexion and extension movements of the head were limited and painful. Rotation of the head was impossible.

Roentgen examination disclosed a fracture of the arches and forward displacement of the body of the axis. No attempt was made at forcible reduction. The pain in the neck was relieved by the application of a plaster-of-Paris collar. The collar was worn for two months. During that time, paræsthesia developed in the upper right arm and a small ulcer appeared on the dorsum of the right foot. Fourteen months after the accident, the general condition was good, the oedema of the arm had disappeared, and the ulcer of the foot was healed. Head movements were still greatly restricted, but were not painful. Roentgen examination disclosed considerable callus.

The second case was that of a woman fifty-five years of age who fell in getting on a car. The symptoms were similar to those in the first case. The patient was kept flat in bed for thirty days and at the end of that time a plaster-of-Paris cast was applied to the neck. Ten months later there was slight limitation of flexion and extension of the head, but the pain had ceased.

The author reviews cases reported by others. He believes that operation is indicated only when the spinal cord is endangered by bone-fragment pressure.

KELOGG SPEED, M.D.

Findlay, R. T.: Fractures of the Scapula. *Ann. Surg.*, 1931, xciii, 1007.

During the past four years, twenty-four fractures of the scapula in twenty-three patients were treated in the Beekman Street Hospital, New York City. The average age of the patients was thirty-six and seven-tenths years. Twenty of the patients were males. All of the fractures were produced by great violence and were complicated by other fractures and injuries. The fracture occurred in the body of the scapula in fifteen cases (57.7 per cent), in the glenoid cavity in five cases (19.2 per cent), in the coracoid process in two cases, in the acromial process in two cases, in the neck of the scapula in one case, and in the spine of the scapula in one case.

Localized pain was present in eighteen cases, tenderness in sixteen, loss of arm function in six, and shock in nearly all. In cases of fracture of the neck of the clavicle, Cotton and Brickley noted inward displacement with narrowing of the shoulder.

For fracture of the body of the scapula the treatment advised is immobilization of the arm with a Velpeau bandage. For fracture of the neck, Scudder recommends the traction-abduction method, and Cotton and Brickley suggest reduction by leverage. Fractures of the acromial process are best treated, according to Scudder, by lifting the flexed arm upward and applying counterpressure on the inner fragment. When the glenoid cavity is involved, early motion is important, but if there is much separation of the fragments the arm should be

fixed to the side with a Velpau bandage for three weeks.

In seventeen of the cases reviewed the immediate result was good and in one it was fair. In three cases death resulted from complications.

RUDOLPH S. REICHER, M.D.

Magnus: Fractures of the Pelvis, Their Treatment and Results. A Report of 1,200 cases (Beckenbrüche, Behandlung und Resultate. Mitteilung von 1,200 Fällen). 55 Tag. d. deutsch. Ges. f. Chir., Berlin, 1931.

In the mining industry the causes of fracture of the pelvis are numerous and varied (burial, a fall from a great height, crushing between two wagons or a wagon and a locomotive or built-in woodwork, the prop, or the wall of the underground passage, and incarceration between the elevator and the shaft wall). This report is based on 587 cases treated in Bergmannsheil during the period from 1925 to 1929 (among them only 20 of long standing); 330 cases from elsewhere in which an examination was made for compensation; 178 cases treated in the period from 1920 to 1924, the reports of which were available; and 115 cases from other hospitals, making a total of 1,210 cases (1,095 treated or examined in Bergmannsheil). The fractures were classified as follows.

Group A, partial fractures of the crest of the ilium (122 cases, constituting 10.1 per cent of the total number).

Group B, simple fractures of a ramus of the pubis or ischium (266 cases, constituting 18.7 per cent of the total number).

Group C, fractures of the base of the acetabulum (69 cases, constituting 5.7 per cent of the total number).

Group D, simple anterior or posterior fractures of the pelvic ring (267 cases, constituting 22 per cent of the total number).

Group E, double or combined vertical anterior or posterior fractures of the pelvic ring (243 cases, constituting 20 per cent of the total number).

Group F, double anterior fractures of the pelvic ring in both pubic and ischiatic rami (99 cases, constituting 8.2 per cent of the total number).

Group G, cases of severe mixed forms of fracture and cases in which death resulted from severe associated injuries before a roentgenogram could be taken (184 cases, constituting 15.3 per cent of the total number).

During the five-year period no change was made in the basic principles of the treatment. Five hundred and eighty-seven of the cases were treated by the author himself. The complications from injury of the bladder and urethra are not considered in this report.

Patients with simple fractures without displacement of the fragments were gotten out of bed and treated functionally as soon as possible. Those with uncomplicated avulsion of the crest of the ilium and simple fissures were sometimes allowed to get up

after ten days. The average length of time such patients were confined to bed ranged from two and eight-tenths to two and nine-tenths weeks, and the average length of time they were kept from work ranged from one and eight-tenths to two and four-tenths months.

In cases of fracture of the base of the acetabulum in which not much interference is necessary, extension is very rarely indicated, and rest in bed, massage, and exercises are usually sufficient, the average duration of confinement to bed was four and six-tenths weeks and the average period of disability was three and eight-tenths months.

Patients with a simple anterior or posterior fracture of the pelvic ring were kept in bed for four and one-tenth weeks and from work for three months; those with a double vertical anterior or posterior fracture were kept in bed for an average of four and four-tenths weeks and from work for an average of three and five-tenths months; and those with a double anterior fracture were kept in bed for an average of four and eight-tenths weeks and from work for an average of three and four-tenths months. In cases of combined anterior or posterior vertical fracture with elevation of one side of the pelvis, the elevated side of the pelvis was brought down by means of a wire introduced through the tuberosity of the tibia. When there was gaping of the abdominal clefts a towel bandage was applied.

The associated injuries, which are not considered in this report, included rupture of the intestines in 5 cases, a tear of the peritoneum or mesentery in 3 cases, and rupture of the liver in 1 case.

In the 587 cases treated by the author, including cases with injury of the urethra, there were 32 deaths, a mortality of 5.5 per cent. If the 9 cases with a urethral injury are not considered the mortality was 1.5 per cent. Four of the deaths were due to fat embolism. The average compensation for the different types of fracture is shown in a table.

In the cases of fractures of mixed types conditions were similar. Of the patients with uncomplicated fractures, only 14 still drew compensation after four years and none received compensation over 30 per cent.

Of the 71 patients with injury of the urethra, who constituted 12.1 per cent of the total number, 23 (32.4 per cent) died. Four died immediately after their admission to the hospital. Ten patients passed bloody urine immediately after their admission; they received no treatment for the hematuria, but none of them died. The introduction of a catheter, which was always tried first if the patient was unable to urinate, was successful 28 times. The catheter was left in place for a while as a retention catheter, but was soon removed. There were no deaths. When catheterization failed, the question arose as to whether a suprapubic or perineal section with union of the torn urethra should be done. Four patients subjected to perineal section died. The author's own experience in these cases (numerous bone splinters, gaping fracture clefts, severe hamatomata) led him

to abandon the method. Suprapubic section was done 25 times with 15 deaths, a mortality of 60 per cent. For drainage, use was made of a metallic bougie of the Volkmann type with a small depression at the tip into which fitted the tip of an ordinary metallic bougie. The ordinary metallic bougie was introduced into the urethra from the bladder. It met the large bougie introduced through the penis at the site of the rupture. With continuous contact of the 2 bougies, the latter was pushed into the bladder and out through the suprapubic incision. After a rubber tube had been fastened over the tip of the bougie, the tube was drawn through the bladder and urethra. It then drained the bladder with one end and at the same time functioned as a retention catheter. This drainage at both ends, which was combined with irrigations of the bladder, was very advantageous. However, the after-treatment with removal of the retention catheter and treatment of the strictures makes great demands. In 6 cases, fistulæ or incontinence remained. The compensation was very high even after a long time. Frequently disturbances of erection and impotence resulted from the injury.

In the discussion of this report, HAUMANN characterized as a rare pelvic injury the unilateral dislocation which is caused by a force exerted from above and behind when the subject is in the kneeling position. It is unknown whether the dislocation or the fracture is primary, but Haumann believes the former occurs first. As is evident from 18 cases, the prognosis is not unfavorable. The treatment consists of wire extension through the crest of the ilium.

BOEHLER stated that pelvic injuries without associated injuries of the urinary passages have a favorable prognosis. In the treatment it is necessary to differentiate between the cases of young and strong miners, such as those reviewed by Magnus, in which very little treatment is necessary, and the

cases of old persons, in which extension is required. The extension should be attached at the site where the muscles, the adductors and psoas, are attached. The latissimus dorsi must also be considered. A great deal depends on the posture. Usually one-seventh of the body weight is used for extension. Boehler favors rest in bed for twelve or thirteen weeks.

STETTNER (2).

Patterson, R. H.: Malunion of Fractures of the Femur. *Ann. Surg.*, 1931, xciii, 984.

Patterson discusses the causes and reports the treatment of malunion of the femur in a series of thirty-two cases. In some of the cases the fracture had been treated by closed reduction and in others by operation. Patterson defines malunion as union occurring in such a manner as seriously to interfere with function.

In 80 per cent of the cases of malunion following closed reduction the malunion was due to a preventable cause such as failure to recognize interposed tissue, failure to secure satisfactory reduction, delay of reduction, and failure to maintain proper position of the fragments until union was solid. In 20 per cent of the cases the causes of the malunion were not preventable, being such factors as associated diseases or injuries.

In sixteen of the cases operated upon the results in general were not encouraging. The worst type of cases is one with marked deformity, excessive callus, and shortening of several inches. In such cases considerable difficulty is experienced in lengthening the limb. While the Abbott method of lengthening is to be recommended, Patterson believes that shortening of the bone ends with proper apposition is often preferable. In conclusion he says that the use of spinal anesthesia in the operative treatment is worthy of further consideration.

PAUL C. COLONNA, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

McPheeters, H. O., Merkert, C. E., and Lundblad, R. A.: Causes of Failure in the Injection Treatment of Varicose Veins. *J. Am. M. Ass.*, 1931, xcvi, 1114.

The authors state that recurrences after the injection treatment of varicose veins may be due to: (1) too great dilution or insufficient concentration of the sclerosing fluid; (2) failure to thrombose the great saphenous vein in the thigh completely as far as the saphenofemoral opening; or (3) normal recanalization, which occurs if the thrombus is not firm and hard. To prevent recurrences, the operator should:

1. Locate the great saphenous trunk by the percussion method and sclerose it up to the saphenofemoral opening.

2. Empty the veins before injecting, to aid concentration.

3. Localize the sclerosing fluid by the use of tourniquets or Mac occluders to prevent excessive dilution.

4. Choose the sclerosing solution according to the type and size of the veins. For small, thin-walled veins, milder solutions, such as invert sugar, should be used; for large sacular veins, dextrose with sodium chloride; and for the pick-ups, quinine and urethane solutions. The authors have abandoned the use of salicylates as they cause severe pain and cramp.

5. Keep the patient under observation until all of the varicose veins have been sclerosed satisfactorily.

6. Have the patient return two months after discharge for re-examination, and thereafter at longer intervals.

The following rules are given with regard to the injections:

1. Employ a sterile technique.

2. Be sure that the injection is made within the lumen of the vein

3. Stop the injection immediately when there is doubt as to whether or not the solution is entering the lumen of the vein.

4. If a perivascular injection has been made, infiltrate the area of the injection with from 10 to 20 c.cm. of a physiological solution of sodium chloride.

5. Apply sponge pressure to prevent leakage when the needle is withdrawn and when the vein wall has been punctured.

6. Re-examine the patient every other day for from six to ten days after the treatment, again at the end of two months, and thereafter at intervals varying from two to four months.

JOHN J. MALONEY, M.D.

Krompecher, S.: The Histopathology of Endarteritis Obliterans. *Telangiostenosis* (Die Pathohistologie der Endarteritis obliterans. Teleangiostenose). *Verhandl. d. 16 Tag. d. Ungar. Gesellsch. f. Chir.*, 1930, p. 321.

Krompecher examined eight extremities which had been amputated because of endarteritis obliterans (thrombo-angiitis obliterans). The ages of the patients ranged from twenty-nine to fifty-five years.

The nature of endarteritis obliterans is a primary narrowing of the small blood vessels. The stenosis of arteries and veins from 1/10 to 2 mm. in diameter is brought on by elastic-element-forming cells called elastoblasts. Often only one-tenth or less of the vessel lumen remains patent. The elastoblasts proliferate between the media and the endothelium (intima formation), and the endothelium is pushed toward the lumen. The elastoblasts then form new elastic lamellæ on their upper surface, which run parallel with the internal elastic membrane and narrow the lumen further.

In most of the cases a secondary thrombosis is associated with the narrowing of the small vessels. The thrombosis may ascend and occlude the large arteries. The thrombus becomes organized and shows recanalization. Stenosis may occur also in the recanalized vessels. In patients of advanced age, arteriosclerosis may be an additional factor. In some cases phlebitis is associated with endarteritis obliterans.

On the basis of the morphological findings, the author uses the name "telangiostenosis" (narrowing of the fine blood vessels) for this condition. The article includes one photomicrograph.

VON LOBMAIER (Z).

Kappis, M.: Experiences in the Treatment of Venous Thrombosis by Means of Adhesive Plaster Dressings (Erfahrungen ueber die Behandlung der Venenthrombose mit Heftpflaster-verbänden). *Deutsche Ztschr. f. Chir.*, 1930, ccxxviii, 317.

In discussing the supposed causes of venous thrombosis, the author states that mechanical slowing up of the circulation is an important factor. Therefore, of the many procedures suggested for the prevention of thrombosis, those directed against mechanical causes appear to be the most promising. In the prevention of pulmonary embolism, the most dangerous complication of thrombosis, the former practice of immobilizing the thrombosed limb for about three weeks and then keeping the patient in bed for several weeks longer was not very successful. Autopsies showed that between 7 and 8 per cent of thromboses resulted in death from embolism.

Since Fischer reported in 1927 that among 2,400 cases of phlebitis treated with compressive dressings he saw no case of embolism, the author has regarded the use of such dressings as the treatment of choice. When deep thrombosis is first suspected a dressing of adhesive plaster or elastoplast is applied circularly about the leg from the toes to the upper end of the thigh. In thrombosis of the saphenous vein, ligation is done high up on the thigh. No further attention is then paid to the condition. The patient is permitted to sit up or to be on his feet just as though no thrombosis were present.

In 100 cases of thrombosis treated in this manner there were 5 fatal embolisms and 13 infarctions of the lung. In 3 cases the adhesive dressing did not exert any influence on the development of the embolism. In 2, loosening of the thrombus seemed to have been favored by getting the patient up on his feet. Therefore only 2 per cent of the embolisms could be ascribed to the treatment. During the same period of time there were 62 fatal embolisms due to unrecognized thromboses.

The dressing hinders the upward extension of the thrombus. As a rule the swelling disappears within a few days and the pain ceases within a few hours. Even thromboses extending up above the thigh seem to be favorably influenced.

The exact site of a thrombus is difficult to determine. When the thrombus extends high, the patient is kept in bed for a week and the head of the bed is elevated. The effect of the treatment is due to the elastic compression. This seems to have a favorable influence also on the secondary swelling of the leg. The dressing is equally effective when used for thrombosis of the arm.

C. E. JANCKE (Z).

Robertson, Sir C., Moore, A. E., and Robb, D.: *Arterial Embolotomy*. *J. College Surg. Australasia*, 1931, iii, 360.

Arterial embolectomy was first attempted in 1895, but the first successful result was reported by Lahey in 1911.

An arterial embolus may begin as a thrombus in a vein and reach the left heart through a patent foramen ovale. In the majority of cases in which excrescences on the valves contribute to embolus formation, organic heart disease is present. Fibrillation of the auricles may also be a factor. A low-grade infection is believed to be present in most cases. Infection favors secondary thrombosis which becomes dangerous through extension of the thrombus with possible destruction of the collateral circulation of the area.

The diagnosis of arterial embolus is made at the outset on the basis of pain, coldness, and possibly discoloration of the limb. There is no swelling, and no blood comes if a needle prick is made. At the site of the embolus the artery may be palpable and tender. There may be partial paralysis of the limb. Movements require effort, cause pain, and are limited. The vessels most frequently involved are the common femoral, axillary, brachial, and com-

mon and external iliac arteries, the bifurcation of the aorta, and the popliteal and subclavian arteries.

In venous thrombosis, the onset and course are more gradual; the limb remains warm, but is blue, and swollen. Pulsation can be felt in the artery. Circulatory disturbances from endarteritis and arteriosclerosis are much slower in onset and progress.

Non-surgical treatment is advised for emboli occurring in small arteries and when surgical measures are refused or are impractical. The authors recommend the application of heat, the administration of cardiac stimulants, and measures to prevent infection. By some, vigorous massage of the area has been practiced.

The surgical treatment consists in exposing and opening the artery, removing the clot, closing the gap, and restoring the circulation. Operation should be performed early, preferably during the first twenty-four hours. After exposure, the artery is clamped at either end of the clot. An incision about 2 cm. long is made at one end of the embolus and the clot is removed by milking it out with the thumb and finger or by catching it with a forceps. When there is a free flow of blood from either side, the incision is closed. A 2 per cent solution of sodium citrate is often used to wash out the site of the clot and to rinse the gloves and instruments.

CLARENCE V. BATEMAN, M.D.

BLOOD; TRANSFUSION

Garibdzanjan, G. A., and Ozereljeff, A. A.: *Blood Transfusion, the Infusion of Salt Solution, and Leaving the Blood in the Abdominal Cavity in Haemorrhage. Comparative Experimental Studies* (Bluttransfusion Salzinfusion, und Zueruecklassen des Blutes in der Bauchhoehle bei Blutverlusten. Vergleichende experimentelle Studie). *Arch. f. klin. Chir.*, 1930, clxi, 486.

With regard to whether the blood of a severe abdominal hemorrhage should be left in the abdominal cavity or re-infused there is considerable difference of opinion. According to exact measurements, the average resorption of blood left in the abdominal cavity is 1.5 c.cm. per kilogram hourly. Therefore in a person weighing 60 kgm. the largest amount of blood which will be resorbed in an hour is 90 c.cm. Actually, the quantity is probably less because of the decrease in the blood pressure. At any rate it is insufficient after a serious hemorrhage to correct the disturbance in the circulation, increase the number of erythrocytes, and overcome oxygen hunger.

In a study of the problems, the author, at Petroff's suggestion, carried out experiments on dogs. Blood equal to 4.5 per cent of the body weight was withdrawn. In the cases of ten of the animals the bleeding was associated with transfusion into the abdominal cavity, in ten with transfusion into the veins, and in ten with the infusion of physiological salt solution. In the cases of three animals only bleeding was done.

Of the first group of dogs, 50 per cent, of the group treated with physiological salt solution, 80 per cent, of those treated by transfusion, 90 per cent, and of those subjected to bleeding alone, only one survived. The dogs given transfusions recovered most rapidly—within a few hours. The findings of morphological studies of the blood corresponded to the recovery.

These studies indicate that leaving all of the blood in the abdominal cavity is not sufficient to overcome the serious manifestations of hæmorrhage. Better results are obtained by re-infusion of the blood or the infusion of salt solution. After an internal hæmorrhage into the abdominal cavity has been controlled it is best to perform a partial re-infusion of from 400 to 500 c.cm. of blood which has been diluted with physiological salt solution in the proportion of 1:3 to lower its toxicity. The rest of the blood should be left in the abdominal cavity since its resorption aids in restoring the normal morphological character of the blood.

STETTNER (Z).

LYMPH GLANDS AND LYMPHATIC VESSELS

Homans, J.: The Operative Treatment of Phlegmasia Alba Dolens. *New England J. Med.*, 1931, cciv, 1025.

The cause of phlegmasia alba dolens and the mechanism of the œdema associated with it are still largely unknown. The character of the œdema suggests that it is due to a lymphatic rather than a venous obstruction, and this is borne out by the experimental findings of Halsted, Reichert, and the author. The lymphatics draining the lower extremities are closely associated with the principal veins and arteries, and the large lymphatic trunks which receive all of the lymph from the limbs lie in and about the arteriovenous sheaths of the iliac vessels. Therefore it should be possible to influence the course of phlegmasia alba dolens by releasing the lymph channels from the inflammatory pressure in which they are held in the arteriovenous sheath.

Homans has succeeded in favorably affecting the flow of lymph from the leg in two severe cases of phlegmasia alba dolens by splitting open the iliac and femoral vascular sheaths. This treatment was followed by a marked reduction in the swelling of the limbs. In both cases, gross inflammatory changes in the perivascular tissues were found. The reaction was quite as marked about the artery as about the vein and suggested that the initial cramp-like pain in thrombophlebitis may be due to an associated ischæmia from arterial spasm. The confinement of the principal lymph vessels within the inflamed arteriovenous sheath is apparently the cause of the lymph stasis in thrombophlebitis, and incision and decompression of this sheath offers a means of improving the flow of lymph from the swollen limb.

LEO M. ZIMMERMAN, M.D.

Utz, L., and Keatinge, L.: Hodgkin's Disease. *Med. J. Australia*, 1931, i, 397.

This article, the first of three reviewing the world literature on Hodgkin's disease during the last hundred years, deals with the history, etiology, comparative pathology, and experimental investigation of the condition. The authors favor the hypothesis that Hodgkin's disease is an atypical tuberculosis probably due to the avian type of the tubercle bacillus.

ELIZABETH CRANSTON.

Lasnier, E. P.: Primary Cancer of the Lymphatic Glands (Cáncer primitivo de los ganglios linfáticos). *Bol. oficial ligua uruguaya contra el cancer genital femenino*, 1930, v, 191.

After discussing a number of classifications for primary tumors of the lymphatic glands, the author concludes that at present there is no classification that is completely satisfactory from the histogenic, histological, and clinical points of view. He states that in every case the blood, smears, and sections, and fluid obtained by puncture of the glands should be examined and the findings so obtained compared with the clinical and therapeutic findings.

AUDREY G. MORGAN, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Ichok, G.: Fixation Abscess (El absceso de fijación). *Arch. de med., cirugía, y especial.*, 1931, xii, 333.

Many ancient remedies come back into use again. Fixation abscess was employed by Hippocrates and has come back into general use in recent years. It is produced as a rule by the injection of turpentine and probably acts through humoral changes brought about by the destruction and renewal of leucocytes. It is of value in puerperal infection, surgical septicaemia and septicopyaemia, epidemic encephalitis, meningococcal meningitis, acute infectious nephritis, malignant forms of eruptive fever, infections of the typhoid group, severe poisonings (particularly lead poisoning), acute bronchopneumonia, lobar pneumonia of the septicæmic type in which defervescence does not occur normally, lobar pneumonia occurring in alcohol addicts and old persons, and severe grippé. In any case of bronchopneumonia it may be induced as soon as the diagnosis is made.

Pic says that the interns in his hospital are permitted to give turpentine injections for the production of a fixation abscess at night in all cases of bronchopneumonia or serious lobar pneumonia without calling the attending physician, just as they would order a bath in cases of typhoid fever or perform an emergency thoracotomy.

AUDREY G. MORGAN, M.D.

Jeanneney: The Treatment of Postoperative Gas Colics by the Injection of Hypertonic Saline Solution (Traitement des coliques de gaz post-opératoires par lavement salé hypertonique). *Bor-deaux-chir.*, 1931, i, 46.

The author reviews the generally accepted theories regarding the causes of postoperative accumulations of gas in the intestines. It is believed that gas formation goes on during the period when the intestinal musculature is paralyzed and that the retention of gas in the loops of bowel is due to spasm of various segments or of the anal sphincter, absence of the usual excitants to peristalsis (such as distention of the ampulla of the rectum), and pain from the abdominal wound which renders the abdominal muscles and the diaphragm unable to expel the gas.

Among prophylactic measures of value are the administration of a light saline cathartic the day before the operation and the rectal instillation of a small quantity of oil the evening before the operation. The injection of a powder or paste into the rectum to aid in the absorption of gas has also been done. The formula for the mixture is: agar-agar, 100 gm., powdered belladonna, 6 ctgm.; and tincture

of aniseed, 50 drops. During the operation, unnecessary trauma should be avoided and the abdominal wall rendered anæsthetic with 20 per cent quinine-urea-hydrochloride. After the operation, morphine should be replaced by tincture of opium given by rectal drip. Beginning thirty hours after the operation attempts should be made to re-establish normal peristaltic movements. Procedures of value for this purpose include subcutaneous injections of pituitrin or phenolsulphone-phthalein, intravenous injections of hypertonic salt solution, and the administration of a 10 to 15 per cent salt solution by rectum by the drip method.

WILLIAM P. VAN WAGENEN, M.D.

Lejars, Brocq, and Duchon: Treatment of Surgical Infections, Particularly Postoperative Bronchopulmonary Infections, with Vaccines of Lyzed Organisms (Traitement des infections chirurgicales et en particulier des infections bronchopulmonaires post-opératoires par les lysats vaccins). *Bull. et mém. Soc. nat. de chir.*, 1931, lvii, 380.

The method discussed is based on the very special properties of the organism causing blue pus, the bacillus pyocyaneus, which has a tendency to destroy infecting pyogenic bodies in the wounds it invades. Bacillus pyocyaneus exerts first a purely bactericidal action. It is capable of sterilizing very rich cultures of streptococci or staphylococci in forty-eight hours. Its lytic action is slower in developing, at least for staphylococci.

Bacillus pyocyaneus neutralizes bacterial toxins. Therefore vaccines made from lyzed organisms are absolutely innocuous.

The tendency of old cultures to develop a certain degree of autolysis may be taken advantage of in the preparation of the vaccine. The polymicrobic vaccine of lyzed organisms is used in postoperative infections and especially in bronchopneumonia in children. The injections must be given daily for at least eight days, and the operation performed within forty-eight hours following the last injection.

Duchon traced the rôle played by superinfection by following the development of the flora in bronchopneumonia day by day. As a result he chose for his vaccines lyzed streptococci, staphylococci, pneumococci, bacillus diphtherie, Pfeiffer's bacillus, micrococcus catarrhalis, and colon bacilli.

For four years the authors have treated pulmonary infections with vaccines made from lyzed organisms without additional treatment. In 70 cases so treated there were 4 deaths. The deaths occurred in cases which had been insufficiently treated. As a rule the temperature decreases within two days following the first injection and thereafter continues to approach normal with simultaneous improvement in

the functional and physical signs. The foci seem to become fixed. Neither the formation nor the development of new foci has been seen when once the treatment has begun to take effect. No complications have been observed. In 1930, the authors and Bezançon reported 132 cases of various surgical infections treated with vaccines made from lyzed organisms. Since then they have observed 61 cases treated in the same way. The vaccines used were of 3 types—1 made of streptococci, 1 of staphylococci, and 1 of both streptococci and staphylococci. Of the 193 patients, only 4 died. One died after 1 injection, and 1, an aged subject, after 3 injections. In the cases of the 2 others who died, bacteriological examinations revealed a secondary anaerobic infection. Anaerobic infection is a contra-indication to the treatment employed.

The gonococcus is easily dissolved by the bacillus pyocyaneus. In gonorrheal arthritis the diseased joint must be immobilized in a grooved apparatus until the pain and fever have subsided. The more serious the disease the longer the vaccino-therapy must be continued. The treatment must be continued until the acute phenomena have completely disappeared. In a series of cases of gonorrheal epididymitis in which the authors used the vaccine of lyzed organisms the treatment was followed by cessation of the pain and subsidence of the swelling.

Vaccines made from lyzed organisms sometimes cause an erythematous reaction around the point of injection, but very seldom produce general shock. It seems that their effect is related to a purely specific action. The daily dose, whatever the vaccine and whatever the age of the patient, is 2 c.cm. In an infection of average intensity it is rarely necessary to exceed 12 injections, especially if after the fifth injection the treatment is given at intervals of two days. However, the injections must be continued until every infectious element has been eradicated.

PAGE.

Charlton, P. H.: Postoperative Parotitis. *Ann Surg.* 1931, xcii, 837.

The author discusses the relative frequency and causes of postoperative parotitis. Deaver classified the cases into three groups: (1) those in which the parotitis is due to metastasis from a pyemic condition, (2) those in which it is the result of ascending infection by way of the ducts, and (3) those in which it is the result of trauma. Charlton prefers to classify them as simple acute, acute suppurative, and gangrenous.

While the staphylococcus is the organism most frequently responsible for the infection, the pneumococcus, streptococcus, and bacillus coli have also been found in the gland. The symptoms depend on the character and extent of the inflammation. In the suppurative type of parotitis a temperature of 105 degrees is not uncommon. Pain is due to the dense fibrous septa in the gland.

The complications include thrombosis, phlebitis, ulceration of the large vessels, and hæmorrhage.

In the simple acute cases, hot or cold applications may be used. The duct should be probed to determine whether obstruction is present. When there is evidence of suppuration, the gland should be incised by a vertical incision within forty-eight hours in order to prevent necrosis and extension of the suppurative condition. The prophylactic treatment should include a careful toilet of the mouth and treatment of any infectious process in the teeth or gums. The author reports thirteen cases.

WILLIAM J. PICKETT, M.D.

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Sordelli, A., and Ferrari, J.: Some Characteristics of Bacillus Perfringens Serum (Algunas propiedades del suero antimicrobiano contra B. perfringens). *Rev. soc. argent. de biol.*, 1930, vi, 513.

The intravenous injection of cultures of bacillus perfringens produces antibodies against this bacillus which are manifested by precipitins, agglutinins, and complement-fixation antibodies. The largest dose of bacteria injected is 20 c.cm. containing 200,000 millions per cubic centimeter. From two to four months are required to obtain an active serum. The serum has precipitating properties for extracts of bacilli cultivated on agar and agglutinates emulsions of bacillus perfringens specifically. It has a high capacity for fixing complement specifically in the presence of a suspension of bacillus perfringens.

The activity of the precipitating serum of bacillus perfringens was tested in experimental infection. Guinea pigs were inoculated with bacillus perfringens, vibrión septique, and a mixture of bacillus perfringens and vibrión septique. The oedema liquid of the three animals was diluted half with physiological salt solution and heated to 100 degrees for fifteen minutes. It was then centrifuged and the three extracts were tested with the precipitating bacillus perfringens extracts. The results were positive for the animals infected with bacillus perfringens and the mixture of bacillus perfringens and vibrión septique and negative for those infected with vibrión septique alone. When the same experiment was carried out with the livers and spleens of the three animals the organs were found to contain no precipitogenous antigen.

The authors conclude that it may be possible to use bacillus perfringens serum for the quick diagnosis of gangrenous affections, but that systematic study of wounds infected with anaerobic bacteria will be necessary to determine the practical value of such a method.

ANDREY G. MOROZ, M.D.

Hauduroy, P.: Treatment with Bacteriophage. Its Advantages, Dangers, and Method of Application (La thérapeutique par le bactériophage. Ses avantages, ses dangers, son mode d'application). *Presse méd.*, Par., 1931, xxxix, 168.

Hauduroy has treated staphylococcus, colon bacillus, and typhoid bacillus infections by the d'Hérelle

method with bacteriophage. The bacteriophage must be prepared by a reliable laboratory. It must be specific and destroy the organism causing the infection. If there is no lysis *in vitro*, there will be no lysis *in vivo*. It is best to prepare the bacteriophage with the patient's own bacteria.

Three or 4 subcutaneous injections of 2 or 3 c.cm. each should be given at intervals of twenty-four hours. These injections only rarely produce a slight local reaction and never cause a general reaction. They should be given at some distance from the focus of infection.

No more than 5 injections should be given as a greater number will sensitize the organism and aggravate the infection. If the lesion is accessible, the bacteriophage should be applied to it on a dressing. The application of bacteriophage on a dressing is never painful. In cases of abscess, a compress saturated with the contents of an ampoule may be applied to the lesion. Local dressings must be supplemented by subcutaneous injections. In cases of intestinal infection, the bacteriophage may be given by mouth. Intravesical instillations of bacteriophage are well tolerated. Injections should never be given intravenously.

Bacteriophage treatment is indicated in all superficial or deep staphylococcal infections such as furunculosis, anthrax, abscess, dermatitis, and pyodermitis, provided the staphylococcus can be destroyed by the bacteriophage. Staphylococcus septicæmia seems not to be benefited; in four cases in which the author used bacteriophage the results were poor.

When the treatment is successful, improvement is usually apparent after two or three days. Open lesions are quickly emptied; the pus flows out easily. Fluctuating lesions open, and undeveloped lesions regress. If the suppuration has not disappeared after eight or ten days, the attempt has failed.

Hauduroy reports a case of anthrax in a woman seventy-nine years old in whom the development of

the disease was checked after the second injection and cure was certain after the fourth injection.

Of the author's cases of staphylococcal infection, a complete cure resulted in about 75 per cent. As the occurrence of lysis was demonstrated *in vitro* before the treatment in every case, the failures may have been due to sensitization of the organism.

In cases in which staphylococcus bacteriophage applied alone was unsuccessful, Hauduroy has obtained excellent results by giving an injection of vaccine after each subcutaneous injection of bacteriophage.

In infections due to the colon bacillus, bacteriophage treatment will result in a cure only if the infection is uncomplicated.

In cases presenting an enterorectal syndrome and in cases of enteritis or dysentery of obscure origin, bacteriophage administered by mouth often gives good results as the bacteriophage seems to restore the intestinal flora to normal.

The author's results with bacteriophage in typhoid fever were mediocre. Recently, Breton obtained a quick cure in 3 very severe cases by giving bacteriophage intravenously. Hauduroy attributes the cure to the severe shock caused by the injection.

PAGE.

ANÆSTHESIA

Schuberth, O.: Deaths Caused by Avertin Narcosis. *Acta chirurg. Scand.*, 1931, lxxviii, 55.

The author reviews seventy-two so-called avertin deaths reported in the literature. He concludes that in eighteen of the reports the details given are not sufficient for judgment regarding the cause of death; in twenty-three cases there was no reason to consider the avertin narcosis responsible for the fatality; in seventeen cases the avertin might have been responsible; in three cases it was probably responsible; and in eleven cases it was certainly responsible.

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Vanoni, E. P.: The Variations in Tension in the Wiring System in Radiology. An Autoregulatory Apparatus (Le variazioni di tensione della rete in radiologia. Un apparecchio autoregolatore) *Radiol. med.*, 1931, xviii, 463.

Vanoni discusses the causes and effects of variations in the line voltage, that is, voltage from the source of electrical energy, and variations in the voltage within the roentgen apparatus, and calls attention to the fact that, in the absence of a stabilizer, variations in the line voltage may lead to erroneous doses in roentgen therapy, poor results in roentgenography, and sometimes injury to the tube. He describes the manually operated stabilizers now in use and calls attention to their disadvantages.

He then describes, in detail, with the aid of diagrams, a movable bobbin type of transformer which operates automatically and corrects variations in the line voltage of from 5 to 25 per cent. The use of this instrument results, not only in a constant tension, but also in a constant milliamperage at the tube and to a great extent eliminates the possibility of error in roentgen treatment and unsatisfactory roentgenographic results. The stabilizer is simply constructed and strong, and can be applied to any type of roentgen apparatus now in use.

PETER A. ROSI, M.D.

Luboshez, B. E.: Cineroentgenography (Cineradiographie) *Radiol. med.*, 1931, xviii, 450.

After discussing the difficulties encountered in cineroentgenography, Luboshez presents the method which has given him the best results. He uses the indirect method, that is, he photographs the image projected upon a fluoroscopic screen. He uses the most luminous screen available, and by dispensing with the lead glass has been able to increase the luminosity of his screen 30 per cent.

The camera designed by Luboshez has a system of specially constructed lenses and an F. O. 625 aperture. This aperture transmits about six times the amount of light that is transmitted through an F. 1.55 aperture. The camera takes eighty exposures in five seconds, and its movements are regulated so that the maximum time possible is spent in the exposure of the film. The movement between exposures requires one one-hundredth of a second and the time of exposure is one-twentieth of a second. The patient is exposed for only five seconds to about 50 ma. of current or a total of 250 ma.-sec., which is probably less than the exposure required for fluoroscopic examination. The danger to the patient is therefore minimal. The author has obtained the best results with the panchromatic film.

The camera and system of lenses are shown by diagrams.

PETER A. ROSI, M.D.

Salotti, A.: Roentgen Study of the Movements of the Jejunum (Studio radiologico dei movimenti dell'intestino tenue digiuno). *Radiol. med.*, 1931, xviii, 421.

Salotti studied the movements of the jejunum by means of twelve films exposed successively at intervals of one second. With this method he was able to observe the gross peristalsis of the jejunum due to contraction of the circular and longitudinal muscles in the wall of the intestine and to follow the movements of the valvulae conniventes, a motility due to the isolated action of the muscularis mucosae.

Peristalsis is of two types—that concerned with transportation of the intestinal contents and that concerned with mixing of the intestinal contents. The former may appear as simple contraction waves progressing down the jejunum or as rotary movements of the intestinal material. The rotary movement was observed during both peristaltic contraction and peristaltic rest. The mixing peristalsis appeared as pendular movements, irregular contractions of a loop of the jejunum, or superficial kneading and mixing movements of the mucosa. The movements of the valvulae conniventes in the completely filled gut were followed by observing the change in the position and contour of corresponding indentations in the barium shadow in successive plates. In the partially filled jejunum, especially during periods of rest, the valvulae conniventes appeared as negative linear shadows encircling the intestine. The movement of isolated valvulae could be followed in the roentgenograms. At times the valves seemed to disappear, leaving a mottled hazy shadow.

The author describes also an arrow-shaped shadow produced by the shadows of the barium-filled folds between the valvulae conniventes which pointed in the direction of the normal jejunal peristalsis.

PETER A. ROSI, M.D.

Wood, F. G., and MacKee, G. M.: Therapy With Long Wave Length X-Rays (Grenz Rays). *Radiology*, 1931, xvi, 697.

Grenz rays are irradiations produced in roentgen-ray tubes run at a voltage of 80 kv. or less and having wave lengths of from 1 to 3 Angstrom units. As they are absorbed practically completely by ordinary glass, it is essential, if they are to be utilized, that the tubes be made of lithium borate glass or have windows of glass of the latter type. Their clinical measurement can be carried out by the use of the Sabouraud pastille or, more accurately, by a specially constructed ionization chamber. Their biological effects are similar to those of other roent-

gen rays, but as they are largely absorbed in the first few millimeters of the skin, their action is less marked in the vessels and characterized chiefly by proliferation of the connective tissue and certain changes in the stratum granulosum of the epidermis.

The apparatus and tubes designed especially for the production of Grenz rays for therapeutic use are described by the authors in detail.

The cutaneous reactions vary from simple erythema to vesiculation and erosion with exudation, and crusting, depending on the size of the dose. Because most of the irradiation is absorbed superficially, the deep derma and subcutaneous tissues are not likely to be seriously damaged by the amounts recommended for therapeutic purposes. While delayed reactions occur, the erythema appears as a rule within twenty-four hours. Regardless of the intensity of the reaction, the inflammation usually disappears in a few weeks. However, the deep pigmentation often persists for many months. Sometimes the erythema dose may be given at one sitting without causing epilation, but if the dose is large, epilation always occurs. Sequelae such as mild atrophy and telangiectasia thus far have been uncommon, but the application of the rays to date has been too limited for an accurate estimate of the possible dangers of small and large doses repeated over a considerable period.

The dosage may be estimated by either the direct or the indirect method or by a combination of the two. The quantity used for the erythema dose by different roentgenologists differs considerably as there is no definite clinical, biological or instrumental standard for the erythema dose. Some roentgenologists place it as low as 200 R, and others as high as 500 R or even higher. Most operators in the United States employ the following constants for the erythema dose: 8 ma., 8 kv., four minutes, and a distance of 6 cm. This gives approximately 370 roentgen units (Glasser). Roughly, most of the technical rules relating to roentgen rays of shorter wave length apply to Grenz-ray therapy.

Grenz-ray therapy finds its chief indications in dermatology. It is very useful for patches of dermatoses located on the scrotum, eyelids, and scalp, such as eczema, psoriasis, lichen planus, lupus vulgaris, and basal-cell epithelioma. It is not suitable for generalized or extensive eruptions.

Reports of the results are still rather meager and come from comparatively few workers. In general, it is doubtful whether the Grenz rays can cure any skin disease which cannot be cured with roentgen rays of shorter wave lengths or with beta rays of radium. The authors enumerate conditions in which Grenz-ray treatment has given good results and those in which its results thus far have been poor.

Attempts have been made to influence various internal diseases by applying Grenz rays to eight areas on the trunk. This method (so-called general or indirect treatment in contradistinction to direct irradiation of lesions) has been used also for certain skin diseases, especially those involving extensive

surfaces, those characterized by remissions and exacerbations, and those due definitely to a general disturbance. The authors discuss the rationale of such treatment, describe the technique used for it, and list the conditions in which good and poor results have been obtained.

The article is supplemented with an extensive bibliography.

ADOLPH HARTUNG, M.D.

Martin, H. E., Quimby, E. H., and Pack, G. T.: Calculations of Tissue Dosage in Radiation Therapy. *Am. J. Roentgenol.*, 1931, xcv, 490.

The authors describe investigations carried out to determine the lethal dose of irradiation for various types of neoplasms and report in detail fifty-six cases of tumors treated by irradiation.

They state that the measurement of energy actually applied to the neoplasm rather than a calculation of that energy from superficial physical factors had made possible more efficient irradiation which decreases the pain and allows an earlier prognosis.

The skin-erythema dose is chosen as the unit of measurement. Doses with external applicators may be determined experimentally. When interstitial applicators are used the calculations of expended energy are made on a curve showing the relations of biological effects and distance in terms of the skin-erythema dose. The authors found that a spherical mass is equally well irradiated by a given quantity of radon whether the latter is concentrated at the center of the mass or subdivided and distributed geometrically about the center, provided the implants are confined within the inner half of the radius. The article contains tables showing the distribution curve in terms of the skin-erythema dose and intensity in the same unit.

Carcinoma of the squamous type require from seven to ten skin-erythema doses for cure. Transitional-cell carcinoma require only from two to five skin-erythema doses. Those of the first type are treated during a period of twenty days, and those of the second type, during a period of nine days. All foci of disease are localized and measured accurately, the type of the lesion is learned, and a predetermined tissue dose is administered. This method, though best carried out on oral tumors, is applicable to tumor masses in general.

CLARENCE V. BATEMAN, M.D.

RADIUM

Magnusson, W.: The Results of Radiological Treatment in Cases of Bone Sarcoma at Radiumhemmet, Stockholm, 1910-1928. *Acta radiol.*, 1931, xli, 101.

The author reports the results obtained in thirty-nine cases of bone sarcoma which were treated radiologically at Radiumhemmet, Stockholm, in the period between 1910 and 1928. As a rule, radiological treatment was given only in inoperable cases and cases in which operation had been performed.

In none of the sixteen cases which were treated by radiological treatment alone was permanent healing obtained.

In one case of osteogenic sarcoma which had been operated upon, but not radically, a cure lasting for more than three years was obtained.

Of the patients who were operated upon and treated radiologically, three are alive and free from symptoms after seven years or more. Two of the latter had a sarcoma of the osteogenic type and one had a Ewing sarcoma.

The author briefly reviews the recent literature on the radiological treatment of bone sarcoma. On the basis of the reports on record and the experiences at Radiumhemmet he comes to the following conclusions:

1. With regard to the indications for radiological treatment, a distinction must be made between osteogenic sarcoma and Ewing's sarcoma.

2. The results of radiological treatment in osteogenic sarcoma to date do not justify the abandonment of surgery. In operable cases, a combination of radiological and surgical treatment should be used. Inoperable cases should be treated radiologically. Even in cases in which the growth has become generalized, radiological treatment sometimes has a good palliative effect.

4. In cases of Ewing's sarcoma, exclusively radiological treatment is justified.

5. Close application of radium is inadvisable. Whether teluradium treatment is preferable to roentgen treatment has not yet been determined. Large doses—from 1 to 1.5 erythema dose focally—are regarded as necessary. High filtration and a large focal distance are essential. It is best to give

the largest possible dose in the first series of the treatment, when the growth is most sensitive and the surrounding tissues are as yet uninfluenced.

6. In the irradiation of Ewing's sarcoma, distribution of the dose over a rather long period is advisable.

7. Coley's toxin treatment may be employed with radiological treatment.

MISCELLANEOUS

Hess, A. F., and Smith, P. E.: Excessive Ultraviolet Irradiation: Effect on the Nutrition and the Endocrine Glands of Rats. *Am. J. Dis. Child.*, 1931, xli, 775.

Two series of rats were irradiated with the mercury-vapor lamp for a period of from five to six months or were given viosterol. Male as well as female animals were used. Those in the first series were litter-mates. Those in the second series were litter-mates, but were the progeny of the first group. Three intensities of irradiation were used—mild, moderate, and severe. The viosterol was given in small as well as in excessive amounts. The main object of the experiment was to determine whether prolonged and intense irradiation or large doses of viosterol had a deleterious effect on the animals evidenced by a change in the rate of growth and the size and appearance of the endocrine glands.

The growth of the animals subjected to ultraviolet irradiation of marked intensity or given large amounts of viosterol was as good as that of the controls and no difference was noted at necropsy between the endocrine glands of the treated and untreated animals.

ADOLPH HARTUNG, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Niven, J. S. F.: The Repair *in vitro* of Embryonic Skeletal Rudiments After Experimental Injury. *J. Path. & Bacteriol.*, 1931, xxxiv, 307.

The part played by the various constituents of rudiments of long bones in bringing about repair was investigated by the author by fracturing and incising the rudiments at various stages of development and then studying the behavior of the fragments after cultivation *in vitro*. Embryonic rudiments of fowls were used chiefly, and embryonic rudiments of the mouse to a less extent.

The results depended greatly on the period of embryonic life at which the injury was made.

In five-day rudiments of the long bones of fowl in which the cartilaginous shaft had been cut through and the fragments had been brought into close apposition, repair occurred rapidly by proliferation of the chondroblasts, so that the fragments fused and no trace of the injury persisted.

At a very slightly later stage, in rudiments from five-and-a-half-day embryos, repair was brought about by a series of processes, prominent among which were: (1) a rapid increase in the adjoining cartilage matrix, there being no proliferation of cartilage cells; (2) restoration of continuity of the surrounding osteogenic tissue and undifferentiated mesenchyme; and (3) the frequent ingrowth of osteogenic cells into the gap between the fragments which sometimes resulted in the formation of osteoid tissue in this situation. The amount of osteoid tissue depended on the closeness of apposition of the fragments, being minimal when the distance between them was small.

When a five-day embryonic femur or tibia was cultivated for twenty-four hours *in vitro* and then incised, the process of repair was essentially similar to that noted in five-and-a-half-day rudiments incised before cultivation.

During and after repair *in vitro*, the development of the rudiments as a whole continued to progress normally, i.e., an increase in length and breadth took place, the epiphyses acquired their characteristic form, and the cartilage and bone showed normal histogenesis.

If the rudiments were fractured at a later stage, when the formation of bone had begun—femora and tibiae from seven-day fowl embryos—repair was effected after restoration of continuity of the osteoblastic layer and fibrous periosteum by the deposition of bone between the fragments. When there was an appreciable gap between the fragments, osteoblasts passed in and continued their histogenesis as in the five-and-a-half-day rudiments. The

cartilage did not participate in the process of local repair. Five-and-a-half-day rudiments which had been cultivated for from six to nine days before being cut behaved similarly to seven-day rudiments fractured before explantation.

When rudiments from nine-day embryos were fractured, the processes of repair were similar to those noted in rudiments from seven-day embryos except that the cells from the osteoblastic layer which filled up the gap between the cut surfaces brought about resorption of cartilage.

In the earliest stage studied—five-day rudiments—the cartilage cells were as little susceptible to injury and as capable of proliferation as the surrounding mesenchyme. Later, from five and a half days onward, they were distinctly more vulnerable and no longer showed regenerative proliferation. These characters increased as histological development of the tissue progressed.

Meckel's cartilage exhibited a behavior somewhat different from that of rudiments of long bones. At a comparable stage of development, to judge from histological appearances, the cells of Meckel's cartilage possessed the capacity for multiplication when the central part of the rudiments of long bones had lost that property. Eventually they also became more susceptible to necrosis after injury. Therefore the behavior of Meckel's cartilage resembled that of the deeper layers of the developing epiphyseal cartilage of long bones.

After fracture of the bones of mice embryos approaching maturity, repair of the cortical bone occurred by the agency of osteoblasts and resembled generally that seen in the bony rudiment of the embryonic fowl. In mouse bones, the deposit of bone was thicker than in fowl rudiments.

SAMUEL KAHN, M.D.

Well, J. A.: Modern Conceptions of Antigen Substances and the Landsteiner Theories (Les conceptions modernes des substances antigènes et les théories de Landsteiner). *Presse méd.*, Par., 1931, xxxix, 656.

An "antigen" is a substance which, introduced into the tissues or the circulation, causes the appearance in the blood of substances called "specific antibodies" which react specifically with it. Recent research has shown that for a substance to act as an antigen it must exist as a colloidal solution, it must be foreign to the animal producing the antibody, and it must penetrate beyond the epithelial surfaces which protect the organism against foreign colloids. Some antigen substances exert a toxic action when they are injected into an animal organism. A large number of others have no toxic or diastatic action. Most antigens are proteid.

It seems that certain lipoids may have an antigenic action. However, the antigenic power of lipoids is not incontestable. When purified phosphatides are used the results are generally negative. Positive results have usually been obtained with lipoids of more or less doubtful purity. It is possible that, as Landsteiner claims, in antigens called lipoids the active antibody is a non-lipoid substance brought along by the lipoids in their solutions. Lipoids possess the strange property of modifying the solubility of proteins and other substances. Modern research suggests that they may confer on the protein antigen to which they are united a peculiar antigenic specificity—for example, in the case of the Koch bacillus, the property of provoking the formation in the animal of serum presenting a specific reaction of precipitation *in vitro* in the presence of particular lipid extracts of the Koch bacillus.

The heterogenetic antigens described by Fotsman are of great interest from this point of view. Although they are present in widely varying animal tissues, they are capable of provoking the formation of hæmolytic antibodies for the blood cells of sheep. This antigenic agent is soluble in alcohol. Landsteiner and Sims found that the lipid element isolated from the heterogenetic antigen, virtually non-antigenic by itself, produces an active heterogenetic antigen if it is mixed with normal serum.

Antigens appear to have two kinds of properties, the property of provoking the formation of antibodies and creating immunity reactions, and the property of being receptors of the antibodies. Receptor antigens are not always provocative antigens. The more complex the constituents of a substance, the more likely it is to possess varied antigenic properties. Microbic bodies, for example, represent very complex antigens.

Obermeyer and Pick found that heat and the action of toluene, chloroform, simple acids, and alkalis produce modifications of the antigenic properties, but do not alter the specificity of the species. On the contrary, when the NO_2 groups are introduced by treatment with nitric acid, when the protein is diazotized with nitrous acid, or when iodine is introduced by treatment with Lugol's solution, the specificity of the antigenic properties of the protein is altered. Specificity of species is perhaps connected with a specificity of chemical structure.

Landsteiner and his collaborators have studied particularly the modifications of the antigenic properties of the proteins as a function of the modifications of their chemical structure. They conclude that the specificity of antigens is apparently determined by the chemical structure of the relatively small parts of the large antigen molecule. The observation of Obermeyer and Pick that the specificity of species is entirely modified and is replaced by a chemical specificity was definitely confirmed.

The research of Landsteiner and his predecessors shows that a serum or a protein of any nature is a complex of a number of different antigens each of

which has a distinct specificity. However, besides the constituents possessing all of the properties of an antigen, these proteins may include also substances which certainly react with antibodies but with which the formation of antibodies by injection into the animal has not yet been demonstrated. Landsteiner believes that tuberculin may be such a substance, and Zinsser's work supports this belief. The character of specificity is determined by the structure of a relatively small part of the voluminous antigen molecule. The formation of antibody, it seems, is a function of the size of the molecule of the antigen.

Substances originating from the cleavage of protein molecules, which may be united to the antibodies but, apparently on account of the small size of their molecule, do not possess the property of stimulating the formation of antibody when they are injected into an animal or organism, are called by Landsteiner "haptènes." PAGE.

Wahlén, B.: Concerning the Toxic Effect of Cod Liver Oil in the Organism. *Acta med. Scand.*, 1937, lxxiv, 430.

From experiments on guinea pigs which were fed a diet containing varying but usually small quantities of cod liver oil, the author draws the following conclusions:

1. It is impossible to draw definite conclusions regarding the intensity of organic changes from the variations of the weight curves.
2. It was the oil alone, without the deficiency in the diet, which was responsible for the injuries noted in the different organs.
3. In guinea pigs it is chiefly the striated muscles, the heart, and the skeletal muscles which react by degeneration to the toxically acting factors in cod liver oil.
4. The skeletal system was free from evidences of scurvy. The scorbutic changes found by Mouriquand were probably due to a basal diet deficient in Vitamin C and were aggravated by the oil.
5. In the tibiae of some of the guinea pigs which received cod liver oil for six months, microscopic examination showed a local subepiphyseal decalcification.

Goldstein, H. I.: Hereditary Epistaxis; With and Without Hereditary (Familial) Multiple Hemorrhagic Telangiectasia. *J. Med. Soc. New Jersey*, 1931, xxviii, 309.

The author reviews the history of epistaxis since Biblical times and calls attention to the association of this symptom with the hemorrhagic diathesis and hereditary hemorrhagic telangiectasia.

He cites 3 families in which epistaxis occurred repeatedly and profusely. In the world literature he has found the records of 65 families and about 350 individuals with hereditary epistaxis and hereditary multiple hemorrhagic telangiectasia. He believes that familial hæmaturia, hæmorrhagic nephritis, hæmoptysis, intestinal and gastric bleeding, and

some of the so-called essential idiopathic hemorrhages are different forms of the condition.

In the first of the 3 families cited by the author there were 6 cases; in the second, there were 3 cases; and in the third, there was 1 case.

The condition must be differentiated from pseudo-hæmophilia, hypertensive epistaxis, purpura hæmorrhagica, hæmophilia, pernicious anaemia, tuberculosis, deficiency diseases, and the hæmorrhagic diathesis. The blood platelets and the bleeding and clotting times are usually normal. Both males and females are affected and may transmit the condition.

The essential characteristics of the condition are:

1. Epistaxis occurring in childhood and often throughout life and sometimes associated with bleeding from other mucous membranes besides those of the nose.

2. The development of telangiectases of various types.

3. The occurrence of signs and symptoms in several members of the patient's family.

The local treatment consists of the use of chromic acid beads, the electric cautery, carbon dioxide snow, radium, or an astringent. This is supplemented by the administration of calcium by mouth and intravenously. Parathormone, viosterol, ultraviolet light, the X-ray, liver therapy, iron, arsenic, and endocrine preparations have also been employed. In cases of severe hæmorrhage, blood injections or the transfusion of a coagulant may be of value.

FRANK B. BERRY, M.D.

Vallery-Radot, P., and Blamoutier, P.: A Fatal Case of Quincke's Disease with Attacks of Abdominal Pain Associated with Vascular Spasms (Un cas mortel de Quincke avec crises douloureuses abdominales accompagnées de spasmes vasculaires). *Bull. et mêm. Soc. d. hop. de Par.*, 1931, xlvii, 459.

In the case reported, the condition began when the patient, a physician, was thirty-one years old and ended in death twenty-two years later. It was characterized by attacks of severe abdominal pain associated with nausea and vomiting, a cutaneous oedema which frequently, if not constantly, coincided with the visceral crises, arteritis of the lower extremities, and intermittent claudication of the fingers. The attacks of abdominal pain recurred at intervals of from six to eight days and usually lasted about twenty-four hours. Occasionally there were attacks of asphyxia, hæmoptysis, and renal insufficiency probably due to oedema and vascular lesions in the larynx, lungs, and kidneys respectively. Oedema of the gastric mucosa caused symptoms suggesting the presence of a foreign body which the patient was able to localize very definitely. The vascular spasms affecting the extremities resulted in pallor, numbness, coldness, and loss of blood-vessel pulsations in these parts. Capillary spasms in the integument of the abdominal wall were also noted.

The authors believe that the vascular spasms were evidence of a general excitation of the sympathetics, but that they did not represent generalized sympa-

thotonic crises. They attribute the spasms of the abdominal organs to stimulation of the solar plexus. As the vascular lesions were first noted seventeen years after the onset of the abdominal symptoms, they are of the opinion that the arteritis was a secondary manifestation resulting from prolonged spasmodic states of the vascular system.

The only daughter of the patient is at present suffering from similar complaints.

HAROLD C. MACK, M.D.

Wallgren, A.: Tubercle Bacilli in Children with Erythema Nodosum: Demonstration by Gastric Lavage. *Am. J. Dis. Child.*, 1931, xli, 816.

Forty children with erythema nodosum were studied to determine the relation of the lesions to tuberculosis. Tuberculin tests, X-ray examinations of the chest, and examinations of the gastric contents for tubercle bacilli were carried out.

Of the thirty-seven children with a positive tuberculin test, seventeen showed tubercle bacilli in the gastric contents. In the three children with a negative tuberculin reaction, the gastric contents were free from tubercle bacilli. In the majority of the children with a positive tuberculin reaction the roentgen examination showed enlarged hilar shadows.

The author believes that his findings support the theory that erythema nodosum is of a tuberculous nature.

SAMUEL PERLOW, M.D.

Rake, G.: On the Pathology and Pathogenesis of Scleroderma. *Bull. Johns Hopkins Hosp.*, Balt., 1931, xlviii, 212.

Apart from the changes in the skin and peripheral vessels, little is known regarding the pathology or pathogenesis of diffuse scleroderma. The author reports a case of more than usual interest because it presented lesions of the sympathetic nervous system. The article contains photomicrographs showing the changes in the skin and nervous system. In one area perivascular infiltration was noted. The atrophic changes in the voluntary muscles were striking.

Rake calls attention to the confusion which exists with regard to scleroderma and Raynaud's disease. According to Kaufman, the form of scleroderma which is sometimes called "sclerodactylia" often begins with symptoms of Raynaud's disease and progresses with atrophy of the bones and mutilation of the fingers.

Recent work of Adson has shown that sympathetic neurectomy has a beneficial effect on Raynaud's disease. This suggests that the sympathetic nervous system has a part in the syndrome. The changes of greatest interest in the author's case were found in the left lower cervical sympathetic ganglion. Some of the ganglion cells were enlarged and pale and showed loss of their structure. Others were small and shrunken. The cells stained deeply and contained excessive accumulations of brown lipochrome pigment granules.

W. N. ROWLEY, M.D.

Haagensen, C. D.: Occupational Neoplastic Disease. *Am. J. Cancer*, 1931, xv, 641.

The cancer data of the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York City, has been reviewed to determine: (1) the occupational distribution, (2) the occupational incidence, (3) the anatomical distribution, and (4) the age incidence of certain types of neoplastic disease. The author's study was limited to the relation of occupation to carcinoma of the skin, mucocutaneous surfaces, bladder, and lungs.

The development of carcinoma of the skin and mucocutaneous surfaces is favored by irritating agents. Among industrial irritants of importance in this respect are coal tar and its derivatives, naphthalene, phenol, pyridine, creosote oil, anthracene, pitch, soot, shale oil, petroleum, and aniline dyes; arsenic, radium; and the roentgen rays. The author reports four cases in which cancer was caused by arsenic used for therapeutic purposes. Cancer of the skin is particularly frequent in outdoor workers who are constantly exposed to sunlight. However, occupational exposure to irritants is only one of multiple causes.

In the cases of cancer of the lung and bladder reviewed by the author, no relation of the lesion to occupation could be determined.

NATHAN N. CROHN, M.D.

Lumsden, T.: Tumor Immunity: The Effects of the Euglobulin and Pseudoglobulin Fractions of Anti-Cancer Sera on Tissue Cultures. *J. Path. & Bacteriol.*, 1931, xxiv, 349.

When the euglobulin and pseudoglobulin fractions of an anti-cancer serum are isolated, the euglobulin fraction contains all of the antibodies which are specifically toxic to cancer cells and any heterotoxins which have escaped destruction during the process of fractioning. The pseudoglobulin fraction contains the anti-species bodies.

By fractioning, anti-cancer serum can be concentrated ten-fold since the euglobulin fraction is ten times less toxic to mice than the equivalent quantity of anti-cancer serum from which it is made although it has lost none of its original toxicity to the cancer cell.

The author believes his experiments demonstrate beyond reasonable doubt the existence of antibodies having a specific affinity for cancer cells.

SAMUEL KAHN, M.D.

Meleney, F. L.: Certain Bacteriological Problems of Surgery. *J. Lab. & Clin. Med.*, 1931, xvi, 675.

Meleney discusses the sterile technique used in the modern hospital, proper operating room clothing for surgeons, assistants, and attendants, the importance of a definite standard in catgut sterilization, the control of infections by means of immunizing agents, bacteriophage, and intravenous chemotherapy, the sources of infection resulting in postoperative pneumonia, and the importance of the anaerobes in the development of peritonitis. He states that the

anaerobe found most commonly in symbiosis with the bacillus coli and intestinal non-haemolytic streptococci is the bacillus welchii, and that, according to clinical evidence, the intraperitoneal administration of nucleic acid and vaccines made from bacillus coli and streptococcus viridans affords some measure of protection against peritonitis.

CLARENCE V. BATEMAN, M.D.

SURGICAL PATHOLOGY AND DIAGNOSIS

Morelle, J., and Bessemans, A.: A Contribution to the Study of the Value and Practical Significance of the Besredka Reaction. The Complement-Fixation Reaction for the Diagnosis of Tuberculosis by Means of the Besredka Antigen (Contribution à l'étude de la valeur et de la signification pratiques du Besredka. Reaction de fixation du complément en vue du diagnostic de la tuberculose au moyen de l'antigène de Besredka). *Rev. belge d. sc. méd.*, 1931, iii, 113.

The authors have made a study of the Besredka reaction in 557 cases. They divide the cases into the following 3 groups:

Group 1. Alleged and suspected tuberculous conditions and conditions proved to be non-tuberculous, 344 cases.

Group 2. Cutaneous affections of uncertain case (psoriasis and alopecia areata), 125 cases.

Group 3. Allergic disorders (asthma and prurigo), 88 cases.

The incidence of positive results of the test in the different conditions was as follows:

Condition	Cases No	Positive results Per cent
Surgical tuberculosis	69	73.8
Genito urinary tuberculosis	..	75.0
Tuberculous adenitis	..	72.0
Tuberculous osteo-arthritis	..	66.6
Cutaneous tuberculosis	83	73.5
Lupus.	66.6
Verrucose	..	80.0
Ulcerative and gummatous	..	64.2
Indurated erythematous	..	93.7
Papillonecrotic	..	66.6
Tuberculides	25	56.0
Lupus erythematosus	..	57.1
Other types	..	50.0
Pulmonary tuberculosis	19	90.0
Suspected tuberculosis	19	73.0
Non tuberculous affections	120	18.6
Alopecia areata	38	44.7
Psoriasis	87	33.3
Asthma	63	66.1
Prurigo	20	70.0

The authors' findings and conclusions are summarized as follows:

1. The incidence of positive reactions is lower in the presence of far-advanced lesions, complications, and extreme debility. Therefore the reaction has a certain value from the standpoint of prognosis.

2. In allergic disease, notably asthma and prurigo, the incidence of false positive reactions is

high and constitutes a source of error which must be taken into account.

3. In psoriasis and alopecia areata the incidence of positive reactions is higher than in control cases. This may signify that these affections are of a tuberculous nature.

4. A high percentage of cases of lupus erythematosus give a positive reaction. This may justify classifying the condition with the tuberculides.

5. Cure or amelioration of affections showing a positive reaction is associated with a lessening of the degree of positivity of the reaction.

6. The complement-fixation reaction of Besredka cannot be compared with the cutaneous tuberculin reaction.

7. There is an inverse relationship between the incidence and frequency of positive reactions and the age of the patient. This is due apparently to the appearance of latent tuberculosis in patients of advanced years.

8. In non-pulmonary types of tuberculosis the value of the Besredka reaction is limited. In early pulmonary tuberculosis and in unsuspected pulmonary tuberculosis, on the other hand, a positive fixation reaction may often be of considerable diagnostic value.

9. As a matter of purely scientific interest, the Besredka reaction may offer interesting information in certain affections of obscure etiology.

HAROLD C. MACK, M.D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

SURGERY OF THE HEAD AND NECK

Head

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INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

EYE

Kriveckij, P.: Blindness and Its Causes (Die Blindheit und ihre Ursache). *Arch. ophthalm.*, 1930, vii, 152, 480.

The most important of the statements and conclusions made in this article are summarized briefly as follows:

1. The causes of blindness must be studied on the basis of the anatomy of the eye.

2. In the determination of the causes of blindness in both eyes which is not due to the same cause the disease of the eye which became blind last is generally held responsible.

3. This is wrong. In the compilation of statistics on blindness in both eyes the causes responsible for the blindness in each eye should be considered separately.

4. Of 178,686 cases of primary eye diseases treated at the Hirschmann Eye Hospital in Charkow in the period from 1908 to 1926, 1,793 (0.95 per cent) were cases of incurable blindness in both eyes and 4,864 (2.72 per cent) were cases of incurable blindness in one eye.

5. These cases represented all types of blindness occurring in Russia. Unusual conditions were responsible for a marked increase in the incidence of blindness from trauma to the eyes in adult men and in boys and from trachoma, poisoning from methyl alcohol and raw whiskey, purulent ophthalmia, scrofula, general starvation, and poor housing conditions.

7. The danger of loss of sight was greatest between the thirtieth and fiftieth year of age, the years of greatest efficiency, and from the sixth to the tenth year.

8. Seven hundred and seventy-two of the patients with blindness of both eyes were laborers and 614 were peasants. Of those with blindness in 1 eye, 1,942 were peasants and 1,025 were laborers. Four hundred and fifty-four children were blind in both eyes and 1,537 were blind in 1 eye.

9. The chief causes of blindness in both eyes in children under one year of age were purulent ophthalmia and congenital causes. Next in frequency were trachoma, trauma, and smallpox and other infectious diseases. The most common causes of blindness in 1 eye in children were purulent ophthalmia, injuries (especially from guns, fire-crackers, and toys), exanthemata, scrofula and other infectious diseases, and neoplasms.

10. The frequency of eye injuries in children and persons who manufacture or sell fireworks makes the question of forbidding such dangerous toys very important.

11. The high incidence of blindness following sympathetic ophthalmia is an indication of unsatisfactory prophylactic measures and medical advice.

12. The chief causes of blindness in 1 or both eyes in adults are injuries to the eyes and the head. Next, in decreasing order of importance in the causation of blindness in both eyes are trachoma, syphilis, intoxications, scrofula, tuberculosis, glaucoma, and smallpox and other infectious diseases, and as in the causation of blindness in 1 eye, trachoma, purulent ophthalmia, smallpox, scrofula, tuberculosis, and other infectious diseases, and glaucoma.

13. In males, blindness is due most frequently to injuries, syphilis, or poisoning, whereas in females it is due most frequently to trachoma, glaucoma, scrofula, or tuberculosis.

15. Sixty-eight per cent of cases of unilateral blindness and 70 per cent of cases of bilateral blindness can be cured.

17. The Ukraine has been active in its care of the blind. As in Germany, the blind are placed in certain industries where they are able to work with great success. Moreover, they are admitted to the general educational schools and the professional and graduate schools free of charge, and unions of the blind in special work communals and in corporations have been created. A. E. GOLDFEDER (O).

Colley, T.: Tumors of the Lachrymal Gland. *Brit. J. Ophthalm.*, 1931, xv, 305.

The author reports the case of a thirty-seven-year-old woman with a tumor in the outer portion of the upper lid, proptosis, diplopia, keratitis, optic atrophy, and reduction of vision to light perception. The tumor extended 35 mm. into the orbit. It was easily removed. As it was encapsulated, exenteration was not done. Within a few months after the operation, vision improved remarkably.

VIRGIL WESCOTT, M.D.

Pellathy, B. von, and Schneider, K.: The Treatment of Conjunctival and Corneal Inflammations, Especially Trachoma, with Sodium Bicarbonate on the Basis of Studies of the Hydrogen-Ion Concentration of the Conjunctival Secretions (Behandlung von Bindehaut- und Hornhautentzündungen, besonders von Trachom, mit Natrium hydrocarbonicum auf Grund von Untersuchungen ueber den pH-Wert des Conjunctivalsekretes). *Klin. Monatsbl. f. Augenh.*, 1930, lxxxv, 774.

In determinations of the hydrogen-ion concentration of the conjunctival secretion in normal and inflamed eyes the authors regularly found a decided increase in acidity in the presence of inflammation. However, this increase was not so pronounced as that noted by Oguchi. In some cases, in agreement with the findings of Miyashita in serpiginous ulcer of the cornea, the alkalinity in the normal eye was also decreased.

As the authors' studies demonstrated a shifting of the reaction of the conjunctival secretion and of the tissues in the direction of acidification, an attempt was made to induce healing by alkalization. Injections of a 1 per cent solution of sodium bicarbonate caused considerable discomfort. Therefore sodium carbonate in powder form was used, as suggested by Horay. The preparations employed were drops of a 5 to 8 per cent solution, an 8 per cent salve, and wet dressings of a 2 to 3 per cent solution. In all cases the treatment proved harmless. A marked influence on the disease process was obtained in a large number of cases, particularly in trachoma and complications involving the cornea. Following instillations, the alkalization of the secretions lasted for less than a minute, and after the use of powder and salves it lasted only twenty minutes. Frequent renewal of the dressings is therefore necessary. It is very doubtful whether alkalization of the tissues is obtained.

MEESMANN (O).

Tiscornia, A.: Keloid Staphyloma (Ectasioma queloides). *Rev. med. Lat.-Am.*, 1931, xvi, 428.

The author reports a case of keloid staphyloma which occurred in a boy sixteen months old and was therefore of extremely rapid evolution. He has found no reference in the literature to a thickening of the cornea as great as that observed in this case. The degree of the thickening and the color, form, and evolution of the condition suggested the initial diagnosis of dermoïdroma.

The boy's mother stated that four days after the child's birth, which was normal, a suppurative process developed in the right eye and a few days later a similar process appeared in the left eye. She applied collyria. After a day or two, when the boy could open his eyes, she noticed a whitish spot in the right cornea and a smaller opacity in the left cornea. The attending specialist found that the child was blind in the right eye. The collyria were discontinued. After a few months the opacities became darker and the right eye more and more prominent. The author first saw the boy at the age of sixteen months. The right palpebral fissure was then almost entirely occupied by a rounded, projecting tumor which, in color and form, resembled a small potato. This tumor was implanted on the cornea and joined to the limbus. The sclerotic was very thin, distended, and slightly bluish (as in staphyloma). The characteristic which most attracted attention and impeded diagnosis was the color of the tumor as a whole—a dull brown—which prevented examination of the anterior chamber and iris. In the left eye the symptoms were more or less the same although less pronounced.

Enucleation was advised, but refused. When the patient was re-examined some time later, the tumors in both eyes were yellowish-white and more like staphyloma, but atypical because of the enormous thickening of the walls. In the right eye the central portion of the tumor was ulcerated irregularly and numerous projecting bits of tissue were immersed in seropurulent fluid. The condition in the left eye was still more suggestive of staphyloma. Although no scars could be seen in the iris, a number of blood vessels extended from the limbus to the corneal center, demonstrating the evolution of the inflammatory process. Enucleation of the right eye was done under chloroform anesthesia and the diagnosis of staphyloma was confirmed by histological examination.

The cornea was found to be enlarged to a thickness of more than 1 cm. The anterior chamber was covered by the iris which, very thin, had ruptured at many points and was adherent to the posterior surface of the cornea. There had been no displacement of the crystalline lens by the intra-ocular pressure, such as occurs in almost all staphylomata secondary to lesions of the cornea. The tumor had developed at the expense of the corneal tissue itself.

In Tiscornia's opinion the neoplasm cannot be considered a congenital staphyloma as there was an initial suppurative process and the history indicated that before the formation of the tumor there had been a leukoma of the cornea. This theory is supported also by the histological character of the specimens.

MARGUERITE P. SLOAN.

Varičavskij, J.: Intracapsular Cataract Operations by the Stanculeanu-Toeroek Method (Ueber Intrakapsuläre Staroperation nach Stanculeanu-Toeroek). *Russk. oftalm. Z.*, 1930, xii, 494.

The author reviews twenty cataract extractions done by the original method of Stanculeanu. This

method was abandoned because the expression of the dislocated lens was difficult. The postoperative course was smoother, but the end-result was no better than that of extracapsular extraction. Therefore the advantages of the procedure did not counterbalance the danger of complications. Following the publications of Elschnig, the Stanculeanu-Toeroek technique with the Elschnig suture and retrobulbar injection was used in eighty-one cases. The pupil was dilated by subconjunctival injections of adrenalin. In the cases of restless patients, luminal was used. As the retrobulbar injections sometimes caused marked hypotonia, they were abandoned. The Liégard suture of the cornea was substituted for the suture of the conjunctiva and the large conjunctival flaps because the latter interfered with the view. Removal of the cataract was done as described by Elschnig. Instead of the "root" incision of the iris, a Pfleger-Hess peripheral iridectomy was done after the suture of the cornea had been knotted. In 31 per cent of the cases combined extraction was done.

Of a total of eighty-one cases, the result was good in forty-eight, fair in eighteen, and poor in fifteen. The conditions were most favorable in the immature forms of cataract. Removal was followed by a good result in 75 per cent and by a poor result in only 9 per cent. In three swollen cataracts the capsule could not be grasped or it burst in the chamber. Of five traumatic cataracts, three were grasped within the capsule after iridectomy and two were normally removed after rupture of the capsule.

Of the forty-eight cases with a good result, prolapse of the vitreous occurred in four, hernia of the vitreous in nineteen, prolapse of the iris in three, excentric pupil in five, and iritis in two.

Of the eighteen cases with fair results, prolapse of the vitreous occurred in two, hernia of the vitreous in two, and iritis in four.

Of the fifteen cases with poor results, iritis occurred in only one.

That unfamiliarity with the technique was responsible for the frequent loss of vitreous is evident from the fact that in the last thirty to thirty-five cases there were no complications. The incidence of prolapse of the iris was the same as in delivery outside of the capsule (4 per cent); in one case the patient himself was to blame. Of the cases of iritis, only two, in which remnants of the cortical layer remained were serious and followed by a marked decrease of vision. In 26 per cent, the slit-lamp showed either a tear of the hyaloid membrane or hernia and cloudiness of the vitreous humor. To these conditions the author attributes the not completely satisfactory results as regards vision. The visual results were determined from ten to fourteen days after the operation; therefore later improvement was possible.

The author believes that the Stanculeanu-Toeroek extraction will be the operation of the future, but must be done only by specialists. It is indicated especially for immature senile cataracts, complete cataracts, atrophic and hypermature cataracts with

a thickened capsule, lamellar and nuclear cataracts, and similar forms in youth. It is indicated conditionally for mature senile cataracts, but is contra-indicated in the "swollen" form with a tense capsule.

G. BRAUN (Ole).

Ellett, E. C.: Retinal Detachment: A Review of Some Recent Literature. *Arch. Ophthalm.*, 1931, v, 784.

Gonin attributes retinal detachment to dissection of the retina from the pigmentary layer by the passage of vitreous through a retinal tear. He recommends sealing the tear by the introduction of a galvanocautery point through a scleral incision.

Sourdille believes that retinal tears are not the causative factor. He therefore makes no effort to localize them exactly. He evacuates the subretinal fluid by multiple punctures deep enough to penetrate the retina and then produces an inflammatory reaction sufficient to seal the separated elements together by the subconjunctival injection of a 1:1000 solution of mercuric cyanide or by cauterization. After this treatment the patient is immobilized in bed for several weeks with the detachment in a dependent position.

SAMUEL A. DURR, M.D.

Bruce, G. M.: Retinoblastoma: Its Recognition When the Fundus Oculi is Obscured. *Arch. Ophthalm.*, 1931, v, 890.

In the case of a child whose fundus is obscured, late retinoblastoma is suggested by the following signs: invasion of the iris, pseudohypopyon, glaucoma or buphthalmos, shrinkage of the globe which may be accompanied by perforation, and intra-ocular hemorrhage with or without blood staining of the cornea. The author reports an illustrative case.

SAMUEL A. DURR, M.D.

Biamond, A.: Experimental Anatomical Investigations on the Corticofugal Optic Anastomoses in Rabbits and Monkeys (Experimentell-anatomische Untersuchungen ueber die corticofugalen optischen Verbindungen bei Kaninchen und Affen). *Ztschr. f. Neur.*, 1930, cxxix, 65.

In the brains of seven monkeys and two rabbits treated by the Marchi method there was found, from twelve to eighteen days after a unilateral operative lesion of the area striata, an extensive secondary degeneration, not only in the homolateral strata sagittalia and the homolateral corpus quadrigeminum anterius, but also in the homolateral corpus geniculatum externum. The demonstration of such degenerations points with certainty to the existence of a corticofugal optic anastomosis in addition to the corticopetal anastomosis of the area striata with the corpus geniculatum externum. This type of anastomosis was first demonstrated by von Monakow in 1889, but was forgotten. Later, Pobst, Bouman, and Brouwer again called attention to it.

From the facts presented in this article it appears very probable not only that every retinal quadrans has its special projection on the cortex, but also that every portion of the external geniculate body

corresponding to a quadrant of the retina can be influenced in a corticofugal direction by its own corresponding cortical area of projection. This statement applies also to the macula. With regard to the cortical relationships of the corpus quadrigeminum anterior it is noteworthy that in the monkeys with lesions of the area striata the secondary degeneration was constantly localized in the dorsal portion of the brachium conjunctivum, in sharp contrast to the ventral localization of the Marchi bundles after destruction of portions of the retina. With regard to the pulvinar, the relationships seem to be such that the corticofugal anastomosis with the corpus quadrigeminum anterior probably only takes its course through the pulvinar without giving off any fibers to this ganglion. It appeared also that the Marchi bundles were always localized in the middle layer of the stratum sagittale internum. Since, according to the author's theory, the corticopetal macular fibers course at the same level in the stratum sagittale externum, it appears that in the strata sagittalia also the arrangement is the same in the corticofugal system as in the corticopetal, since in the area striata lesions the projection area of the macula was destroyed. The position of corticopetal fibers in the "temporal knee" of the optic radiation as described by Flechsig becomes doubtful.

There are, moreover, in Java apes a frontoparietal and a parietofrontal fasciculus and a temporoparietal and an occipitoparietal fasciculus. Otherwise there appear to be no uninterrupted anastomoses between the different cerebral convolutions. In the monkeys studied the degenerating fibers of the pons passing over to the crossed hemisphere in lesions of the area striata never reached the occipital pole, but gradually exhausted themselves quite a distance from it. Repeatedly some of the fibers mentioned separated themselves out to disappear in the strata sagittalia and could be traced no further.

In conclusion, the author discusses the following hypothesis as to the function of the corticofugal tracts passing from the area striata to the external geniculate body:

Psychophysiological considerations demand the possibility of an influence of optic memory pictures upon the actual picture in the area striata and also upon parts of the latter, in either a strengthening or a weakening sense. One can then imagine the transition from vision to perception as follows:

The optical picture is projected upon the area striata. Associations, especially with similar or related memory pictures, result. If the similarity is to become an identification, certain details must undergo a slight alteration in a positive or a negative sense. This strengthening or inhibiting influence is exerted over the motor cells in the deeper layers of the area striata upon the external geniculate body and every individual part of the latter. All of this, of course, is related only to perception. As soon as any kind of associations are combined with the picture seen (perception in the psychological sense), it is evident that the stimulus has spread along the

association tracts over the rest of the cerebral cortex.

This hypothesis ought to give an acceptable explanation for the two chief findings in this work, namely, that the corticofugal optical projection proceeds only from the area striata, and that this projection has a localization corresponding to that of the corticopetal. It explains also the so-called hemianopic weakness of attention first described by Oppenheim and later explained by Poppelreuter on the basis of tachistoscopic investigations.

R. A. PRELTER (O).

EAR

Meyer, M.: Inflammatory Diseases of the Middle Ear. I. The Pathological Anatomy of Spontaneous and Experimental Inflammatory Changes in the Middle Ear of the Ape, and a Few General Remarks on the Structure of the Simian Middle Ear (Ueber die entzündlichen Erkrankungen des Mittelohres. I. Zur pathologischen Anatomie spontaner und experimenteller entzündlicher Mittelohrveränderungen bei Affen, mit einigen allgemeinen Vorbemerkungen ueber den Bau des Affenmittelohres). *Ztschr. f. Laryngol., Rhinol.*, 1937, **xx**, 89.

The author reports studies of the middle ear of the ape, especially the macacus rhesus and the hamadryas (baboon), in which species the anatomical conditions resemble very closely those in man. Inflammatory reactions were induced experimentally by three methods: (1) the injection of chemicals (oil of turpentine, a 2 per cent solution of cantharides in chloroform) or of bacterial preparations (staphylococcus and colon bacilli which had been passed several times through experimental animals, and streptococci) through the apparently insensitive drum membrane; (2) injections of these substances through the extremely thin corticalis of the mastoid process or directly through openings chiseled in the mastoid process; and (3) injections of these substances through the eustachian tube following preliminary splitting of the soft palate. All of these methods were successful except the injection of streptococci through the eustachian tube, and the failure of the latter procedure may have been due to mere chance.

The clinical study of the process was hampered by the long narrow external auditory meatus. In spite of the use of specially constructed specula, the drum membrane could not be seen clearly. Therefore in future experiments a preliminary operation will be done to shorten and widen the external meatus.

Even when the chemical irritant was applied only once and for only a short time to a single small, closely delimited area, the entire system of interconnected cavities became inflamed. When the bacterial irritants were employed, the process was much more pronounced. However, the products of inflammation were not produced uniformly throughout the system of cavities, nor were they most pronounced in the areas about the spot where the irritant

was applied. In the catarrhal (chemical) as well as the purulent (bacterial) inflammatory reactions the inflammation was milder and less purulent about the spot of application of the irritant than in the more distant middle ear cavity.

The process of organization had begun by the seventh day. In one case a chronic or recurring otitis media resulted in connective tissue formation with extensive adhesions and ossification ending in ankylosis of the stapes and occlusion of the fenestra rotunda. In one case a cholesteatoma-like structure was found.

F. GROSSMANN (H).

Ormerod, F. C.: Tuberculous Disease of the Middle Ear. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 953. *J. Laryngol. & Otol.*, 1931, xli, 449.

Mastoiditis may develop in the first month of life and result in necrosis of bone around the antrum before there is much development of the process. Facial paralysis is considerably more common in children than in adults, and appears to be due to pressure from granulation tissue. The formation of granulation tissue is very marked, and healing after a mastoid operation is very slow. In most cases it is necessary to perform the complete radical operation before healing can be obtained. Aural tuberculosis is more active and much more likely to spread to the mastoid process, other parts of the temporal bone, and the meninges in children than in adults. JAMES C. BRASWELL, M.D.

Thomson, Sir St. C.: Tuberculosis of the Middle Ear As Met With in Adults in a Sanatorium. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 959. *J. Laryngol. & Otol.*, 1931, xli, 460.

Involvement of the middle ear is a comparatively rare complication of tuberculosis. It occurs in less than 2 per cent of cases admitted to a sanatorium. The painless onset of a scanty, thick otorrhea and marked deafness in an adult should suggest the condition. Tubercle bacilli can be detected in the aural discharge in only a minority of the cases. Confirmation of a provisional diagnosis should be sought in a careful general examination, the sputum, the temperature, and X-ray examination.

This form of otitis media is best treated in a sanatorium where, in addition to general care, the patient can have the benefit of artificial pneumothorax, phrenic avulsion, or thoracoplasty, which have proved beneficial in tuberculosis of the larynx.

Active local measures are rarely called for and may be disastrous because the complication indicates a severe general infection with a grave prognosis.

JAMES C. BRASWELL, M.D.

Taylor, H. K.: The Roentgen Findings in Suppuration of the Petrous Apex. *Ann. Otol., Rhinol. & Laryngol.*, 1931, xl, 367.

In suppuration of the petrous pyramid exclusive of labyrinthitis, the most valuable information obtained on roentgen examination is yielded by a base plate (inferosuperior projection) of the head. By

this projection, pneumatization of the petrosa, changes in aëration, and pathological changes can be visualized.

Operative interference is indicated when positive roentgen findings are observed in cases presenting clinical symptoms suggesting petrous pyramid suppuration. Taylor believes it is advisable to roentgenograph the petrous portion of the temporal bone in every case of acute aural infection and in every case of protracted aural discharge.

Nine cases of suppuration of the petrous apex are reported.

GEORGE R. McAVULFF, M.D.

NOSE AND SINUSES

Kemler, J. I.: Implantation of Ivory in Ozena: Approved Technique; Further Observations. *Arch. Otolaryngol.*, 1931, xiii, 726.

The technique described by Kemler consists of the implantation of a piece of ivory into the floor of the nose after elevation of the mucosa. The periosteum is raised to the sharp ridge of the piriform aperture and the floor of the nose slowly and carefully elevated until a deep and wide pocket is obtained. The elevation is extended onto the septum as well as the lateral wall of the nose. Care is taken to prevent tearing. The greatest difficulty is encountered at the ridge, which is higher than the floor. As the floor of the nose is approached the elevator is depressed. The largest suitable piece of ivory, which has been boiled for ten minutes, is introduced. It should fit loosely. The wound is closed with silk sutures, and a dry piece of gauze then placed in the nose.

After the operation the patient is kept in bed and an ice bag is applied to the side of the face. There is usually some swelling and discoloration, and the temperature may rise to 100 degrees F. The beneficial effects from the constant irritation of the implant and the narrowing of the nasal chamber become apparent immediately.

Experience has shown that narrowing of the nasal chamber with stimulation of the mucosa relieves the most distressing symptoms of ozena, namely, fetor, headache, and the formation of large crusts.

In the author's cases treated by the procedure described there has been no extrusion of the implant except in one instance in which the ivory was not sufficiently smoothed down. In all cases in which the ivory was implanted in the septum it became extruded after a shorter or longer period of time.

In cases of marked deflection of the septum the septum is fractured to the midline and implants are placed in one or both sides of the nose.

JOHN F. DELPH, M.D.

MOUTH

Martin, J. M.: Radiation Therapy in the Treatment of Cancer of the Mouth and Lips. *Radiology*, 1931, xvi, 881.

Martin reports the results obtained after from five to ten years in 119 cases of carcinoma of the

lower lip which were treated with roentgen rays alone. He does not state that the diagnoses were proved by biopsy. Eighty-seven per cent of the patients were well after five years. The roentgen-ray dosage is difficult to estimate as it is not expressed in R units. A single exposure to the primary lip lesion consisted of "slightly less than 2 minimal erythema doses." This dosage was repeated every other day for from 4 to 6 exposures. Heavier dosages were reserved for the treatment of the neck.

In the treatment of cancer of the mouth, the author implants radium-containing platinum needles in the growth and leaves them *in situ* for seven or eight days. The dosage is calculated on the basis of the destruction of 1 c.cm. of cancer tissue by a centimeter length of needle. While Martin has not used this technique long enough to be able to report statistics, his results have been so favorable that he believes he is obtaining a cure in a high percentage of cases.

C. D. HAAGENSEN, M.D.

Rosenthal, W.: The Pathology and Treatment of Defects of the Palate (Pathologie und Therapie der Gaumendefekte). *Fortschr. d. Zahnh.*, 1930, vi, 953.

According to Veau, heredity plays an important rôle in the development of cleft formation. Harelip and cleft palate are very frequently unilateral and occur more often on the left than the right side. Eighty-one per cent of Veau's 400 patients had unilateral harelip or cleft palate. In 33 per cent the condition was unilateral and incomplete, in 48 per cent unilateral and complete, in 7 per cent bilateral and incomplete, and in 12 per cent bilateral and complete. Frequently the malformation appears in only the first child of the family.

The author reports a case of congenital, pedunculated tumor, the size of a fist, which was firmly attached to the dorsum of the tongue. The microscopic findings indicated that the tumor arose from a tying-off of the submaxillary duct. The cause of the neoplasm was found to be a wide cleft of the soft palate which involved a part of the hard palate. A roentgenogram is shown.

In operating for harelip, the author sutures the lip by Veau's procedure so that the skin, the musculature, and the mucous membrane are united separately without any sacrifice of tissue and with minimal tension. In the most frequent form of unilateral complete harelip and cleft palate, the floor of the nose is reconstructed before the cleft in the lip is closed. The reconstruction of the nasal floor by flap formation from the septum is shown in 2 sketches. The intermaxillary bone must not be removed. The reposition of the vomer is best carried out by the Reich-Matti and Trundt method. The lip is sutured in layers according to the procedure of Hagetorn and Hertel. In the suturing of a cleft palate, Veau's method is followed. In retroposition of the palate the size and development are first determined by means of roentgenograms in order that a function disturbing defect in the anterior cleft region may not

be caused by the backward displacement. The blood supply and innervation of the palate and the operative procedure according to the Limberg method with separation of the bone spicules situated behind the foramen palatinum are shown in illustrations. A carefully folded pad of iodoform gauze is pressed against the surface of the palate after its repair and the palate further protected by a bronze wire fastened to the teeth. Closure of the fissure and staphyloplasty are described with the aid of roentgenograms.

Education in speech is of great importance. The time at which it should be started varies from case to case. Dental after-treatment must not be neglected. The phonetic results must be judged with consideration of the demands of the language of the country and its dialects. Noises which do not belong to normal speech and false formation of sounds demand careful study and require secondary operations or orthodontic procedures for their correction.

KÄRGER (Z).

Peyton, W. T.: The Dimensions and Growth of the Palate in the Normal Infant and in the Infant with Gross Maldevelopment of the Upper Lip and Palate: A Quantitative Study. *Arch. Surg.*, 1931, xxii, 704.

Alkan measured the width and length of the hard palate with calipers and calculated the height in a series of 35 infants from one to nine days of age. The average measurements were: width, 2.7 cm., length, 3.2 cm., and height, 1.2 cm. Denzer obtained the following average measurements of palates of children under one year of age: width, 30.9 mm., and height, 8.79 mm. These were obtained by measuring dental casts made from impressions of the palates. In 514 persons over fifteen years of age, Buser found the width at the first molar to be 35.5 mm. Franke found the length of the palate to be 26.8 mm. at birth and 52.8 mm. in the adult.

Studies of the growth and amount and disposition of tissue in the cleft palate are meagre. It was claimed by Brophy and others that, with rare exceptions, children with malformed palates have the normal amount of tissue in the palate. It is generally believed, however, that there is a deficiency of tissue in the cleft palate. Keith found that in cleft palate in the adult the bony parts were from 10 to 15 mm. less than normal, whereas in cleft palate in newborn children the deficiency did not exceed 3 mm. on each side. According to Winternitz, the halves of the cleft palate are rudimentary and their relative growth is not in proportion to the growth of the oropharyngeal cavity. Hence, in later years, the cleft is not only wider, but the lack of development results in a relatively short soft palate and is the cause of poor speaking function after repair.

The author made careful measurements of 2 groups of children. The first group was made up of 91 normal children (51 females and 40 males) ranging in age from a newborn (premature) infant to a child three hundred and sixty-two days old

and varying in length (crown to heel) from 45.7 to 75.7 cm. The second group included 26 abnormal children (6 females and 20 males) ranging in age from a premature infant to a child four hundred and twenty-five days old and varying in length from 47.5 cm. to 75.1 cm.

The size of the head and the surface width of the palate were found to be approximately the same in the 2 groups, but there was a significant difference in the widest transverse diameter of the normal and the cleft palates. During the period of growth included in the study, the normal palates showed an increase in width of approximately 6 mm. whereas the cleft palates showed no increase in width.

The cleft palates were definitely higher than the normal palates although there was a 1-mm. increase in the height of the normal palates during the period studied and no increase in the height of the cleft palates.

There was no essential difference in the length of the alveolar process in the 2 groups, but during the period studied there was a 5-mm. increase in the length of the alveolar arc of the normal palates and a similar, if not slightly greater, increase in the alveolar arc of the cleft palates.

The width of the cleft became smaller during the period of observation, the decrease being approximately 4 mm. This decrease was probably due to the growth of the tissues toward the midline.

Congenital malformations of the upper lip and palate are more common in boys than in girls and occur more frequently on the left than the right side.

WILLIAM G. HAMM, M.D.

Nicolas, G.: **Tuberculosis of the Tongue. Swiss Statistics for the Last Ten Years** (Die Tuberculose der Zunge. Schweizerische Sammelstatistik aus den letzten 10 Jahren). *Deutsche Ztschr. f. Chir.*, 1930, ccxxvi, 46.

Tuberculosis of the tongue is relatively rare. Only about 400 cases have been reported. Exact figures are difficult to obtain. Among the 60,000 cases of tuberculosis in Switzerland in the last ten years there were 26 recognized cases of tuberculosis of the tongue. Amrein found involvement of the tongue in only 5 of 22,000 cases of tuberculosis. The incidence of tuberculosis of the tongue given in the literature ranges from 0.14 to 3.75 per cent. The condition occurs usually between the ages of twenty-five and fifty-five years. It is especially frequent in the twenty-eighth, thirty-sixth, and fiftieth years of life, but reaches its maximum incidence in the forty-first year. The left half of the tongue is more frequently involved than the right, and a lateral border oftener than the point. Next, in decreasing frequency of involvement, are the dorsal surface, the ventral surface, and the base. According to some statistics, about 80 per cent of the subjects are men.

With regard to the portal of entry of the infection, the author makes only general statements which apply as well to other localizations of the infection. Theoretically, there may be some relation of the

tongue involvement to the flora of the mouth. The infrequency of lingual involvement is thought to be explained in part by the fact that the tongue is a muscular structure and tubercle bacilli do not readily attack muscle tissue. It is due also to the rich blood supply and the mobility of the tongue and the constant cleansing effect upon it of the saliva.

Primary tuberculosis of the tongue without clinical signs of the disease elsewhere is especially rare. Primary exogenous infection produces tuberculosis, abscess, or ulcer. Ulcer is the most common. Spontaneous healing is possible. Primary invasion usually takes place on or at the base of the tongue. Lingual localization in a case of generalized tuberculous infection appears as a miliary dissemination of a progressive character (miliary tubercle, tuberculoma, verrucous papilloma, lupus) or of a regressive character (cold abscess, tuberculous fissure, ulcer tuberculosum). As a rule several of these forms are present simultaneously. The tuberculous nodules usually appear closely grouped and ulcerate with slight provocation, new crops appearing on the edge of the patch. The prognosis is unfavorable; operation will not help or is impossible.

Tuberculoma is usually isolated. As a rule it shows central caseation, abscess formation, and ulcer formation. It is difficult to differentiate from the harder and more elastic forms of fibroma and the more resistant forms of carcinoma. However, when it is ulcerated it does not bleed like cancer. Swelling of the glands is slight, and pain is rare. The diagnosis is based on histological examination.

Verrucous papilloma is exceedingly rare; only 5 cases are on record. It seems to occur only between the forty-fifth and fiftieth years. It is a pinkish tumor made up of prominent villi and showing a grooved border. It is usually found at the base of the tongue. Ulceration is absent and swelling of the glands is rare. Excision usually results in cure.

Lupus is rare in the tongue. Cold abscess causes little trouble until the tension becomes high or there is interference with swallowing and speech. Tubercle bacilli will not be found in the pus and only rarely are discovered in the walls of the abscess. Rupture of the abscess results in an ulcer or fistula or a sudden generalized infection.

The tuberculous fissure is merely a variation of ulcer. The ulcer is the middle or the end stage of the other disease forms. It appears in solitary or multiple form. The differential diagnosis is difficult.

In his discussion of the treatment of lingual tuberculosis the author merely reviews the methods which are generally employed. Those used most frequently are excision and cauterization. SPENCER (II).

PHARYNX

Keen, J. A.: **Abnormal Hemorrhage After the Tonsil and Adenoid Operation.** *J. Laryngol. & Otol.*, 1931, xlii, 297.

Primary hemorrhage after the removal of tonsils and adenoids depends to some extent on the method

of operation. The average amount of blood lost after the guillotine operation is just under 2 oz.

Keen compares the dissection and the guillotine operations with regard to hemorrhage and operative failures. He advocates the guillotine method of enucleation. "Regrowth" of tonsillar tissue after complete enucleation has not occurred in his cases.

Of 9,344 operations performed by the author, excessive hemorrhage occurred in 110 (just over 1 per cent). Keen discusses the amount of blood lost and the best methods of dealing with such hemorrhages.

Attention is called to the fact that a second anæsthetic is extremely dangerous in cases with hemorrhage. The author reports 3 fatal cases and discusses the possible causes of death.

Dangerous hemorrhage appears to come more often from the nasopharynx than from the tonsil areas.

The author reviews the literature on the prophylactic use of calcium lactate. He believes that calcium lactate shortens the clotting time of the blood.

He reviews all of his cases of secondary hemorrhage after tonsil and adenoid operations which occurred during a period of ten years. He believes that hemorrhage after the removal of tonsils and adenoids is due chiefly to deficiency in the clotting power of the blood and that anatomical and surgical factors are of secondary importance. He describes a simple test for determining the bleeding time and discusses the coagulation time, bleeding time, and various hemorrhagic diatheses from the theoretical standpoint.

In conclusion he reports cases in which tests of the bleeding time were made.

JAMES C. BRASWELL, M.D.

NECK

Cole, W. G., Womack, N. A., and Ellett, W. H.: The Production of Hyperplasia of the Thyroid Gland by Chemical Means, with Special Reference to Purine Bases and Their Derivatives. *Arch. Surg.*, 1931, xxii, 926.

In a theoretical discussion of protein by-products which may be physiologically active, reference is made to the work of Vaughan, Kendall, and Jones. In two dogs which the authors injected for three days with a dosage of histamine "insufficient to produce toxic symptoms of marked significance," the thyroid showed definite desquamation, loss of colloid, and beginning hyperplasia. Xanthine, caffeine, theophylline, and theobromine used in similar experiments produced similar results. Ninety chemical compounds were studied, but are not listed. Most of them were without effect. A large series of inorganic drugs (names not given) were also administered without producing changes in the thyroid. The positive effect of histamine and the methyl-purines is interpreted as indicating that the thyroid is directly influenced by these products of protein catabolism.

PAUL STARR, M.D.

Lahey, F. H.: Apathetic Thyroidism. *Ann. Surg.*, 1931, xciii, 1026.

All that is so positive in activated thyroidism is negative in apathetic or non-activated thyroidism. The former condition occurs most frequently in youthful or middle-aged persons, whereas the latter is most frequent at or beyond middle age. Persons with activated thyroidism tend to have either a marked exophthalmos or a very obvious stare, whereas those with apathetic thyroidism tend to have no exophthalmos and little, if any, stare. In activated thyroidism the thyroid is usually larger than normal and the pulse is full and bounding, but in apathetic thyroidism the thyroid is usually small and firm and the pulse varies from 100 to 120. In activated thyroidism the skin is moist, hot, and soft; in apathetic thyroidism it is dry, firm, and relatively cool. In the former condition the basal metabolism ranges from +50 to +100, whereas in the latter, as would be expected, it usually ranges from +40 down to +20 and occasionally lower.

Patients with serious and fatal reactions following partial thyroidectomy for apathetic thyroidism either never awaken from the anæsthetic or waken only to sink comfortably into a semi-stupor or complete unconsciousness and die gently with practically none of the signs which accompany death in activated thyroidism.

All patients with an unexplained loss of weight, unexplained toxæmia, and unexplained myasthenia should be subjected to a careful clinical examination for apathetic thyroidism, regardless of the absence of the typical signs of hyperthyroidism.

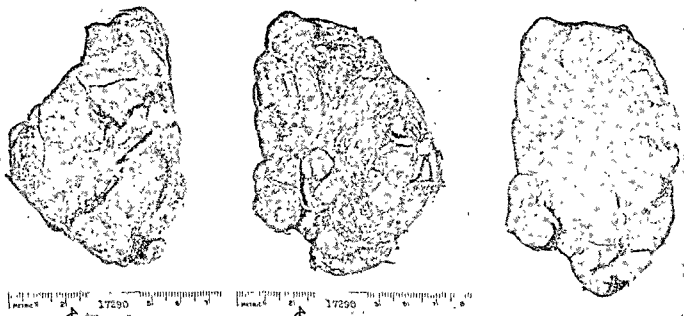
There are, of course, all gradations between the extremely intense activated thyroidism and the extreme, almost somnolent type of thyroidism in aged persons.

Not infrequently, patients with apathetic thyroidism maintain a pulse rate on the operating table under 120 and without excessive pulse pressure. The surgeon may therefore assume that the entire operation may be done safely in one stage. As a warning against too early and too much surgery he should depend upon the pre-operative history rather than the high pulse rate, pulse pressure, and basal metabolism, and the excessive activation and intensification of the thyroidism which are characteristic of the activated type of the condition.

R. V. B. SMER, M.D.

Graham, A., and McCullagh, E. P.: Atrophy and Fibrosis Associated with Lymphoid Tissue in the Thyroid: Struma Lymphomatosa (Hashimoto). *Arch. Surg.*, 1931, xxi, 548.

This is a report of four cases in which thyroidectomy for non-toxic enlargement of the thyroid was done, malignancy being assumed and struma lymphomatosa (Hashimoto) being found. The patients were women between forty-five and seventy-five years of age who complained of hoarseness, pressure, choking, and stridor. In one case there was a history suggesting thyroiditis.



Anterior, mesial, and cut surface of the left lobe in the case in which the diagnosis of struma lymphomatosa was made clinically. Lobulation obscured by the diffuse fibrosis.

The physical examination disclosed no particular characteristic distinguishing these goiters from others. The metabolic rates were normal. The clinical diagnoses were inoperable carcinoma, colloid goiter, adenomatous goiter, and, in the case suggesting thyroiditis, struma lymphomatosa.

At operation, the gland was found pale, friable, sometimes hard, and usually normal in contour. The appearance suggested diffuse carcinoma, lymphosarcoma, Riedel's struma, or non-specific thyroiditis. Macroscopic examination revealed a normal contour, uniform bilateral enlargement to several times the normal size, close attachment to the trachea, and an intact capsule not adherent to overlying structures. The glands were white and firm or hard, cutting with the resistance of cirrhotic liver. No normal thyroid tissue was recognizable grossly. Microscopic examination disclosed atrophy, re-

placement fibrosis, diffuse lymphoid infiltration, germinal lymph centers, and fibrous thickening of the capsule. There was no evidence of acute inflammation, abscess, tubercles, caseation, or gumma.

In the authors' opinion, this condition is not an early stage of Riedel's struma as the latter occurs in younger persons and is characterized by a more symmetrical inflammatory process which extends beyond the gland into the cervical tissues, whereas in these cases the patients were older, the glands were uniformly involved, and the process was within the capsule. They suggest that as the lymphoid tissue in their cases resembled the lymphoid tissue frequently found in the thyroid in hyperthyroidism, the condition might represent a terminal stage of a hyperthyroid process. However, the histories gave no evidence of preceding hyperthyroidism.

PAUL STARR, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Ochsner, A.: The Diagnosis and Treatment of Acute Craniocerebral Injuries. *Am. J. Surg.*, 1931, xii, 222, 523.

Fracture of the skull is of no significance unless there is concomitant injury of the cerebral substance. Acute injuries of the head are classified as follows:

- I. Cerebral injuries with or without cranial injury.
 - A. Concussion.
 - B. Oedema.
 - C. Contusion.
 - D. Laceration.
 - E. Hæmorrhage (intradural, extradural).
- II. Injuries without brain involvement.
 - A. Scalp wounds.
 - B. Skull fracture.
 1. Vault.
 2. Base
 3. Simple (linear, comminuted)
 4. Depressed.
 5. Compound

Concussion represents a physiological rather than an anatomical lesion as it is associated with no demonstrable changes in the cerebrum. It is characterized by immediate temporary unconsciousness followed usually by headache and nausea and occasionally by vomiting. As a rule there is rapid recovery from all symptoms, but sometimes the patient dies without recovering consciousness. At autopsy, no gross lesions can be demonstrated. It is important to recognize cerebral concussion in order that proper therapy may be instituted. In every case of loss of consciousness, regardless of its duration, a period of rest is imperative in order to prevent the development of sequelæ.

Most of the symptoms in acute craniocerebral injury are due to increased intracranial pressure, the most frequent cause of which is cerebral oedema. A vicious circle is set up, the increased intracranial pressure interfering with the venous return and this interference hindering the absorption of cerebrospinal fluid so that the amount of the fluid is increased. As the condition progresses, the compression of the arterioles results in cerebral anæmia. Cerebral oedema is usually diffuse.

Contusions, lacerations, and localized hæmorrhages of the brain occur much less frequently than oedema. Blood in the cerebrospinal fluid is important as it causes meningitis. Essick and Bagley have shown experimentally in young animals that hydrocephalus may be produced by subarachnoid injections of blood. Subdural hæmorrhages are important

not only because of their immediate effects, but also because of their later sequelæ. Scalp wounds are of importance because they represent possible portals of entry through which organisms may gain entrance to the cerebrum and meninges.

Of the various cranial fractures, fractures of the base are more important clinically than fractures of the vault unless the latter are compound. Fractures of the base are usually compound by virtue of the fact that they extend into one of the nasal accessory sinuses. The prognosis should be more guarded in cases of basal fracture than in those of fracture of the vault not only because of the danger of infection, but also because of the associated injury to the cortical centers in the former.

The diagnosis of acute craniocerebral injuries is made on the basis of a history of injury and unconsciousness, the findings of neurological examination, and determinations of the cerebrospinal fluid pressure. In the diagnosis of basal fractures, which are extremely difficult to diagnose roentgenologically, hæmorrhages and a discharge of cerebrospinal fluid from the ears, nose, or mouth are of importance. A careful neurological and physical examination should be repeated frequently in order to detect any progression of the lesions. Of extreme importance in the determination of the extent of the injury and the prognosis are the eye manifestations, especially changes in the pupils. Patients exhibiting pupillary changes have a much less favorable prognosis than those without such changes. Unilateral dilatation with fixation of the pupils occurs almost invariably on the side of the injury and is usually due to hæmorrhage.

Blood-pressure changes occur relatively late in the course of acute craniocerebral injuries and are therefore of little aid in the diagnosis except as an indication of shock. Of great importance in the diagnosis, prognosis, and treatment is the determination of the cerebrospinal pressure and the character of the cerebrospinal fluid. The pressure should be determined immediately after the patient recovers from shock. When the fluid contains blood, repeated spinal taps should be done to remove as much of the blood as possible.

At the present time the treatment of acute craniocerebral injuries is largely conservative. Operation is done in fewer than 5 per cent of cases. If the patient is in shock, it is imperative that the shock be combated before any other condition is treated. A 50 per cent solution of glucose should be administered intravenously. As emphasized by Fay, the use of other hypertonic solutions during the period of shock is absolutely contra-indicated. If the cerebrospinal fluid pressure is higher than 10 mm. Hg, enough cerebrospinal fluid should be

removed cautiously to decrease the pressure above 10 mm. Hg by one-half; *i.e.*, if the cerebrospinal fluid pressure is 20 mm. Hg, enough fluid should be withdrawn to reduce the pressure to 15 mm. Hg. In the presence of compound fractures, careful débridement and primary suture should be done. The use of morphine and other narcotics is to be condemned because the depressing effect exerted by such drugs on the cerebrum may mask the development of symptoms. In cases in which the cerebrospinal fluid pressure remains elevated, repeated lumbar punctures with withdrawal of cerebrospinal fluid is indicated. In the reduction of the increased intracranial pressure the administration of hypertonic solutions both intravenously and by rectum is of great value. The intravenous administration of a hypertonic sodium chloride solution is seldom indicated because if the solution is given too rapidly it is toxic, and as sodium chloride is dialyzable it causes an increased sodium-chloride content of the blood which leads to secondary tissue retention with a rapid return of symptoms. The substance of choice for intravenous use is a 50 per cent glucose solution, which is an effective dehydrating agent. From 50 to 100 c.cm. of a 50 per cent glucose solution may be administered intravenously every six to eight hours, depending upon the severity of the cerebral oedema. The decrease in intracranial pressure is more gradual following the use of glucose than following the use of hypertonic saline solutions. Ebaugh and Stevenson found no rise in the pressure even eight hours and forty-five minutes after the administration of glucose. Magnesium sulphate given by mouth or by rectum is a valuable dehydrating agent, but should never be used in the presence of shock.

In rare cases, hypotension of the cerebrospinal fluid may occur. For the correction of this condition the intravenous administration of sterile distilled water is advocated.

While operative interference is rarely indicated in acute craniocerebral injuries, it is necessary in cases with scalp wounds, compound or depressed skull fractures, and a localized intracranial hematoma. Depressed fractures should be elevated. A small percentage of the patients who do not respond to conservative treatment should be given the advantage of operative decompression.

Rodman, J. S.: *The Surgical Management of Cranial Injuries.* *Ann. Surg.*, 1931, xciii, 1017.

Rodman reviews the treatment of cranial injuries from prehistoric times up to the present. He then briefly outlines his own treatment of such injuries, which varies with the degree of intracranial compression and includes such measures as the intravenous administration of hypertonic glucose solution, magnesium sulphate purges, restriction of fluid intake, and lumbar puncture.

Mortality statistics based on 800 cases are tabulated. It is evident that a certain percentage of cases are inevitably fatal, but that a much larger

percentage always terminate in recovery. In the remaining 25 per cent, the outcome often depends on the judgment and experience of the surgeon.

LEO M. DAVIDOFF, M.D.

Evans, W.: *The Pathology and Etiology of Brain Abscess.* *Lancet*, 1931, ccxx, 1231, 1289.

The author reviews 194 cases of abscess of the brain treated in the period from 1908 to 1925 in the Bernhard Baron Institute of the London Hospital. He uses the term "brain abscess" to denote abscesses in the cerebrum, cerebellum, and brain stem. The process begins with an inflammatory leucocytic infiltration and softening of the cerebral substance and ends in conversion of a portion of the brain into a cavity containing pus. In acute cases the abscess was found to have no distinct wall, but its cavity was lined with a shaggy and ragged débris. The adjacent brain substance was oedematous and generally presented multiple minute and scattered hæmorrhages. In cases of chronic and clinically more latent abscess the lesion was surrounded internally by a definite wall, the so-called pyogenic membrane, and external to this there was a layer of granulation tissue.

In acute abscesses, a pale yellow, creamy fluid or a hæmorrhagic fluid was found. The contents of the chronic abscesses, which consisted of a fetid, greenish-yellow or bright green, viscid pus, presented a more characteristic appearance.

The exciting cause may be any of the pyogenic organisms. In abscesses following middle-ear and mastoid infections, the organisms were generally multiple. Abscesses of the brain complicating intrathoracic suppuration often yielded a pure culture of streptococci. In multiple abscesses of the brain following pyæmia due to osteomyelitis, the staphylococcus was usually the only organism isolated. Frequently the contents of the abscess were sterile.

Careful measurements of the abscess were made in 168 instances. Some of the abscesses were as small as a pinhead and others larger than an orange. Large abscesses were much more frequent than small abscesses. Abscesses which were formed as the result of direct local spread of the primary infection tended to be larger than abscesses formed by the transmission of infected material from a distant focus to the brain by way of the blood stream. The size of the abscess tended to vary inversely with the rapidity of onset of serious symptoms and death. Abscesses of the cerebellum were small and produced symptoms early.

In most of the cases the abscess was spheroidal, but in 27 per cent it was ovoid. A distortion in the outline and shape of the abscess in the form of a finger-like projection commonly resulted when the abscess was of considerable size and approached the lateral ventricles of the brain. The diverticulum eventually perforated the ependyma of the ventricle and gave rise to pyrocephalus. Abscesses occurred in the cerebrum twice as frequently as in the cerebellum.

Abscesses of the brain were fairly common in children under the age of six years. Their incidence was highest between the ages of eleven and thirty-five years and lowest between the ages of fifty-six and seventy years.

In 131 cases (67.5 per cent), the abscess of the brain resulted from direct extension of infection which originated at a site not far removed from the brain. In 109 (83.2 per cent) of these cases the source of the infection was the middle ear and antrum, and in 12 (9.1 per cent) it was the nasal cavity and its accessory sinuses. In 37 of the former the infection spread by purulent thrombosis of the lateral sinus. In 28 of these 37, the abscess was found in the cerebellum and in 9 it was in the cerebrum. In 28 of the 109 cases in which the source of the infection was in the middle ear and antrum the abscess formation followed osteomyelitis of the tympanic wall. In 1 case the infection spread by way of the internal auditory meatus. In 43 cases it probably spread along the adventitial spaces of perforating blood vessels.

In 7 of the 12 cases in which the abscess of the brain resulted from the direct spread of infection from suppuration in the nasal cavity and its accessory sinuses there was osteomyelitis of the wall of the nasal cavity. In 3 cases the infection had apparently spread along the perineural spaces, and in 2, along the veins opening into the cavernous sinus.

Infection had been conveyed to the brain by the introduction of a foreign body in 8 cases (4.1 per cent). No abscess of the brain was discovered at autopsy in 318 cases in which death followed bruising, hemorrhage, or laceration of the brain without puncture of the skull, 51 cases presenting acute osteomyelitis of the skull, or 3 cases of syphilis involving the skull.

In 46 (23.7 per cent) of the 194 cases the brain abscess was due to the hematogenous spread of infection from a distant focus of suppuration. In 22 of this group it was a complication of intrathoracic suppuration, and in 24 it followed extrathoracic suppuration. Abscess of the brain was found to be a fairly common complication of bronchiectasis.

In 321 cases of chronic bronchiectasis, autopsy revealed 11 abscesses of the brain, whereas in 494 cases of acute purulent bronchiectasis it revealed none. Of 485 consecutive cases of empyema, abscess of the brain was found in only 3. Of 228 cases of non embolic abscess of the lung, an abscess of the brain was revealed by autopsy in none. The author found that abscess of the brain is not a common lesion in systemic pyæmia and is rare in actinomycosis and tuberculoma of the brain.

Pyocephalus was found associated with brain abscess in 40 per cent of the cases. The spread of infection into the ventricles occurred either gradually from leptomeningitis or suddenly as the result of direct rupture of the finger-like process from the abscess cavity into the ventricle.

Leptomeningitis, either generalized or localized over the site of the abscess, was found in 67 per cent of the cases. ROBERT ZOLLINGER, M.D.

Rejtö, S.: A Study of Otogenic Abscesses of the Cerebrum Based on Nine Cases (Ueber die otogenen Abscesses des Grosshirns auf Grund von neun Fällen). *Otologi hetil.*, 1930, ii, 721.

In 621 cases in which an operation was performed on the ear there were 15 brain abscesses. Nine of the abscesses were cerebral abscesses and 6 were cerebellar abscesses. The 9 cerebral abscesses were all in the temporal lobe, but a few extended to the occipital lobe. Eight of the 9 patients with cerebral abscess were men. The youngest patient was seven and the oldest forty-two years of age. The others were between eighteen and twenty-eight years old. The histories of the 9 cases of cerebral abscess are reported. In 3 cases the brain was examined histologically. In the 3 cases in which a cure was obtained the manifest symptoms developed in the hospital and operation was performed within twelve hours after their appearance. Of the patients who were brought to the hospital with meningitis, all died.

The most favorable time for operation is at the beginning of the manifest stage. However, operation should be tried in all cases as the excessive brain pressure may suggest the terminal stage and even this picture may show marked improvement after operation. The author calls attention to the fact that in the cases reviewed all of the cures occurred in cases in which there was no change in the dura, the site of the abscess was located by brain puncture, and no meningeal adhesions were present. The most frequent symptom was headache, and the second most frequent symptom a slowing of the pulse. Slowing of the pulse can be observed only in cases without inflammation of the meninges.

The author has treated 2 cases of cerebellar abscess and 1 case of cerebral abscess by Lemaitre's method with good results. In 1 of the cured cases he changed the packing daily. In the third cured case, packing was done only once. Immediately after the operation the patient's relatives removed him from the hospital and took him to the country. His condition was then apparently hopeless, but six months later he returned cured. He reported that the dressing was changed by the country doctor only once or twice. GEORG KEREKES (II).

De Martel, T., Denet, J. C., and Guillaume, J.: Operative Treatment of Sellar and Suprasellar Tumors (Traitement opératoire des tumeurs sellaires et suprasellaires). *J. de chir.*, 1931, xxvii, 321.

For the operative treatment of sellar and suprasellar tumors the patient is seated in a natural position and the head fixed with three metal clamps covered with rubber. After the flap is cut the chair is turned backward at an angle of about 80 degrees so that the anteroposterior axis of the head is almost vertical. The shape and position of the frontal flap are shown in illustrations. Local novocain-adrenalin

anæsthesia is used. The cutting of the flap is painless, but detachment of the dura mater and particularly of the internal nasal nerve from the cribriform plate of the ethmoid is painful. For the latter steps local anæsthesia is induced with sponges wet with a 1:100 solution of novocain. A needle is passed through the cortex to the lateral ventricle and left in place throughout the operation to allow the cerebrospinal fluid to flow out. The frontal lobe is lifted and dissected back carefully to the site of the tumor. An accurate knowledge of the anatomy of the region is necessary. The authors describe the vessels and show their position by an illustration. Great care is necessary in the approach as injury of the infundibular region is probably the cause of the complications sometimes occurring during and immediately after the operation. When the tumor is removed it leaves a cavity, at the base of which the infundibulum can be seen beneath the anterior border of the chiasm.

In addition to operable tumors and Rathke's pouch (a congenital cyst which can be removed after puncture), there may be gliomata of the chiasm or aneurisms of the carotid which are inoperable. The surgeon should know of the presence of the latter in order that he may avoid making unsuccessful attempts to operate upon them.

Adenomata of the hypophysis may be operated on by either the transfrontal or the transphenoid route. The transphenoid operation is contradicted if the tumor has perforated the diaphragm of the sella and the absence of perforation cannot be determined definitely. Moreover, this operation is associated with danger of infection; even Cushing, who performs it with marvellous skill, has a mortality of 5 per cent from meningitis. It is very hard to open the posterior wall of the sphenoid sinus without injuring the chiasm, and the operative field is so small that the operation is extremely difficult.

After the operation there may be an infundibular syndrome with fever and narcolepsy or mental disturbances due to pressure on the right frontal lobe. However, these symptoms generally begin to improve within from twenty-four to forty-eight hours and disappear by the end of the fifth day.

AUDREY GOSS MORGAN, M.D.

Hesse, E., and Bogomolova, L.: Sympathectomia Cervicalls Superior. Ramicotomy in the Treatment of Paralysis of the Upper Branch of the Facialis, Paralytic Lagophthalmos (Die Sympathectomia cervicalls superior, die Ramicotomie als Methode der operativen Behandlung der Paralyse des oberen Facialisastes, Lagophthalmus paralyticus). *Vestnik. Chir.*, 1930, lviii/lx, 25.

Resection of the cervical sympathetic, proposed by Leriche in 1919 for paralytic lagophthalmos, has been done eight times by Hesse and Bogomolova—five times by resection of the superior ganglion and three times by ramicotomy of the first to the fifth cervical nerves. With the exception of a single case in which they resected neither the rami communi-

cantes nor the ganglion but only a small piece of the sympathetic trunk, a very considerable improvement in the ability to close the eye resulted. In one case there were even distinct active movements of the eyelids.

The simplest explanation of the improvement lies in the sinking in of the eyeball (Korner's symptom.) The restoration of active movements is explained by Bourguignon by the existence of an anastomosis between the two facial nerves, the function of which, inhibited by the sympathetic fibers, is restored after section of those fibers. The authors believe that the best technical procedure is the division of the rami communicantes of the first to the fifth cervical nerves with preservation of the sympathetic trunk and the superior ganglion.

The authors' clinical experiences were supplemented by experiments on dogs and rabbits (Bogomolova). Unilateral division of the facial nerve followed by sympathectomy on the same side sometimes resulted in considerable improvement in the ability to close the affected eye. In anatomical preparations of the branches of the facialis in animals the authors have as yet been unable to demonstrate an anastomosis between the two facial nerves.

N. PETROV (Z).

SPINAL CORD AND ITS COVERINGS

Craig, W. McK.: Spinal Cord Compression: Tumors and Allied Non-Traumatic Conditions. *Am. J. Surg.*, 1931, xii, 303.

Tumors of the spinal cord, if diagnosed and removed early in their development, can be permanently cured. Any condition which produces compression of the spinal cord may simulate a tumor of the spinal cord.

In order to correlate more fully the clinical, surgical, and pathological aspects of compression of the spinal cord, material gathered from cases seen at the Mayo Clinic in the period from 1912 to 1929 was analyzed. The terminology was confined to an accepted classification, and the microscopic examination was made by means of frozen sections stained with hæmatoxylin and eosin.

In the 312 cases studied, 223 tumors were found which involved the spinal cord only by compression. These were classified as extramedullary, and were divided into 156 intradural and 67 extradural tumors. Eighty-nine tumors involving the spinal cord were classified as intramedullary.

Included in the group of 67 extradural tumors compressing the spinal cord were lesions arising from bone, intervertebral disks, extradural fat, spinal nerves, and blood vessels as well as unsuspected metastatic malignant lesions. A pre-operative diagnosis of a bony extradural lesion may often be made by roentgenological examination. It is possible also to make a presumptive diagnosis of metastatic malignant lesion when the primary lesion can be determined.

The intradural extramedullary series of tumors constituted the largest group and had the most

favorable prognosis. Such lesions take their origin from the fibroblastic structures of the meninges and the vessels of the meninges or are projected into the subarachnoid space from outside of the dura or from within the spinal cord. The 2 predominating types of tumor are the endothelioma or meningeal fibroblastoma and the neurofibroma. In the cases reviewed, about half of the intradural extramedullary tumors proved to be endotheliomata and about a third were neurofibromata.

Of the 89 cases of intramedullary tumors, tissue was available for study in only 62. Tumors arising from the cord and comprising the group of gliomata predominated, but benign encapsulated tumors which could be removed completely were also found. In a number of cases in which tissue was not removed, palliative relief was obtained from the decompression coincident to laminectomy.

In view of the fact that laminectomy can be performed with minimal risk, exploration can be carried out in many atypical cases of compression of the spinal cord for palliative as well as for diagnostic purposes. In a very high percentage of cases of compression of the spinal cord a differential diagnosis

between inflammatory and neoplastic lesions can be made before operation by roentgenological examination, a complete neurological study including examination of the cerebrospinal fluid, and the use of lipiodol when indicated. However, the exact pathological nature of the underlying cause of compression is rather difficult to determine. The pathological analysis herewith reported furnishes evidence of the multiplicity of lesions that may be encountered at operation.

SYMPATHETIC NERVES

Phillips, G.: The Apparent Diminution in Skeletal Muscle Tonus Following Removal of the Lumbar Sympathetic Trunk. *Med. J. Australia*, 1931, i, 628.

The authors do not believe that the post-ganglionic sympathetic fibers constitute the efferent limb of the reflex arc subserving posture in skeletal muscle. On the contrary, they are of the opinion that sympathetic denervation is followed by an apparent diminution in tonus because of increased excitability of the afferent nerve endings subserving the lengthening reaction.

LEO M. DAVIDOFF, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Stubenbord, J. G., 3rd: *Cancer of the Breast; An Analysis of 108 Cases of Cancer of the Breast; A Clinical Index of Malignancy. Surg., Gynec. & Obst.*, 1931, lili, 1001.

The author reviews cases of cancer of the breast which were treated on the First Surgical Division of the New York Hospital. His article contains tables showing the total, marital, racial, and age incidence of the condition, the situation, extent, and pathological characteristics of the tumors, the occurrence of metastasis, the type of operation, and the clinical and histological classification of the cases.

Eighty-four of the patients are known to have survived operation for at least five years. Of these, twelve could not be traced and only seven were well after five years.

It was found that the clinical grading of carcinoma of the breast gives a more accurate prognosis than the histological grading.

NATHAN N. CROHN, M.D.

TRACHEA, LUNGS, AND PLEURA

Carajannopoulos, G., and Lazarides, P.: *The Treatment of Hydatid Cysts of the Lung and Its Results. Twelve Cases Operated on and Cured (A propos du traitement des kystes hydatiques du poumon et de ses résultats. Douze cas opérés et guéris). J. de chir.*, 1931, xxxvii, 529.

In Greece, the frequency of hydatid cyst of the lung is relatively high, such a cyst being found once in every 175 pulmonary operations. The authors report twelve cases which they treated surgically in the last three years.

The Weinberg reaction was found unreliable in the majority of cases. Eosinophilia and Cason's cuti-reaction proved of more value. The latter was more sure and constant than the Weinberg reaction and eosinophilia, especially in cases of non-suppurating hydatid cysts.

After obtaining a general idea of the condition of the thorax with the fluoroscope, the surgeon and roentgenologist should make a systematic examination with the patient in different positions.

Operation is not indicated for small central cysts situated near the hilum which are unbroken and do not cause serious complications such as repeated dangerous hemoptysis. Neither is it indicated for broken central cysts which, after vomica, show signs of spontaneous cure. It is necessary, however, for central cysts which give rise to dangerous hemorrhages or, after rupture, have an unfavorable effect on the general health. It is indicated also for central cysts larger than an orange, and for all cortical or intrapleural cysts.

In the cases reviewed by the authors, the patient was generally placed in a half-sitting position, inclining toward lateral decubitus on the normal side. In some cases, Lamas' jockey position was used. Local anaesthesia was employed with entire satisfaction. The pleura was opened wide according to the advice of Delagenière with regard to the gradual and slow production of pneumothorax. Tuffier's retractor was used. The lung was then explored and so fixed that the most superficial portion of the cyst was in the center of the operative field. In order to reduce bleeding to the minimum, the penetration of lung tissues was restricted as much as possible. This precaution is especially important when the cysts are deep. Great care was then taken to protect the pleural cavity by tamponing. After the first evacuating puncture, the cyst was mobilized toward the exterior, where it was opened and its membrane and contents were removed. The edges of the incised cyst were then sutured and the cyst was fixed to the wall.

The authors have adopted the one-stage operation for all cases of hydatid cyst without pleural adhesions and with no suppuration. In 2 of 6 cases in which a cavity limited by adventitia remained after the ablation of a cyst with clear, non-suppurative contents they considered it necessary to tampon and drain. In the 4 others the method of Gèroulanos was used. This consists in provisional drainage of the cavity limited by the adventitia with a drain of very small caliber around which the lips of the cavity as well as the parietal layers are hermetically sutured. The free end of the drain is closed by a ligature so that all communication between the cavity and the outer air is cut off. In cases with a normal and afebrile evolution it is necessary only to empty the cavity of the fluids which accumulate in it and carefully close the end of the drain. Removal of the drain on the fifth or sixth day is followed by primary healing. Such healing occurred in 3 of the authors' 4 cases. If suppuration sets in, systematic drainage should be begun immediately. This occurred in the authors' fourth case.

In most of the cases the postoperative period was relatively smooth. In 1 case there was a cyst of the right upper lobe with such loose and limited pleural adhesions that opening in one stage and drainage were followed by purulent pleurisy, the pulmonary incision having communicated with the pleural cavity and the cyst contents having been slightly cloudy. However, the pleurisy was quickly cured. In no case was there a permanent postoperative fistula. Bronchial fistulae, which were relatively frequent, always closed as healing progressed.

PAGE.

Moersch, H. J.: The Treatment of Pulmonary Abscess by Bronchoscopy. *Ann. Surg.*, 1931, xciii, 1226.

Contrary to general opinion, the treatment of pulmonary abscess constitutes one of the most difficult of therapeutic problems. It has been estimated that in from 50 to 70 per cent of cases of pulmonary abscess in which treatment is not given, the condition is fatal. In some cases, absolute rest, postural drainage, and supportive measures will lead to recovery, but in a large group further treatment is necessary. In the past, operative procedures have been employed in cases of the latter type, but the mortality from surgical interference was extremely high and operation did not assure an absolute cure.

In recent years, bronchoscopy has been found a valuable aid in the treatment of pulmonary abscess.

Bronchoscopy is not only a valuable therapeutic measure but, in association with roentgenography, history taking, and a general examination, is a necessary procedure for the accurate diagnosis of pulmonary abscess. However, in spite of the greatest care, the differentiation between pulmonary abscess and tuberculosis, bronchiectasis, empyema, foreign body, and benign and malignant tumors of the bronchi is not always possible.

In the last five years, 140 patients with pulmonary abscess have been observed at the Mayo Clinic. One hundred and five were treated bronchoscopically. Seventy-six were males. The youngest patient was eighteen months old and the oldest seventy-four years. Five patients were in the first decade of life, 7 in the second, 22 in the third, 29 in the fourth, 27 in the fifth, 11 in the sixth, 2 in the seventh, and 2 in the eighth.

The most common cause of the pulmonary abscess was tonsillectomy.

The duration of the abscess in the 105 cases varied from one week to more than eight years.

The location of the abscess as determined by means of roentgenograms, general examination, bronchoscopy, surgical procedures, and, in some cases, autopsy, was as follows: right upper lobe, 23 cases; right middle lobe, 9 cases; right lower lobe, 34 cases; right lung, multilobular and indeterminate, 9 cases; left upper lobe, 9 cases; left lower lobe, 17 cases; and left lung, multilobular and indeterminate, 4 cases.

Although no particular lobe failed to respond to treatment, the incidence of cure was lowest in cases of abscess of the left lower lobe and the right upper lobe.

The bronchoscopic treatment resulted in cure in 51 cases and improvement in 18. In 23, it was unsuccessful, and in 7 its results were questionable. Six of the patients died. The term "cure" signifies that all symptoms disappeared completely. "Improvement" signifies definite improvement of symptoms. "Unsuccessful" signifies failure to obtain clinical improvement—either the patient failed to cooperate, surgical measures appeared to be indicated, or bronchoscopy was performed as an adjunct to operation. "Questionable results" signifies lack of

sufficient data as to the outcome; however, in cases with such results surgical procedures were not advised and there was no mortality.

The amount of bronchoscopic drainage necessary in the treatment of a pulmonary abscess varies with the conditions of the particular case, and the length of time the patient should be kept under observation and the frequency of bronchoscopy must vary with the physician's experience. Care must be exercised to avoid carrying the patient along for an unnecessary period of time and thereby increasing the difficulties of the thoracic surgeon if the bronchoscopic treatment is not successful. Of the 105 cases reviewed, bronchoscopy was performed once in 65, twice in 22, 3 times in 10, 4 times in 6, and 5 times in 2.

In conclusion the author says that bronchoscopy should be used in conjunction with both medical and surgical measures, and that at present it is probably one of the most efficient procedures in the treatment of pulmonary abscess.

Danna, J. A.: The Treatment of Empyema by Aspiration and Air Replacement Without Drainage: A Review of Thirty-Five Cases. *J. Am. M. Ass.*, 1931, xcvi, 1453.

The procedure described consists in emptying the empyema cavity of pus through a large needle and, as the pus is removed, replacing it with a like volume of air. In none of the thirty-five cases in which it was used did a serious infection of the chest wall result from the needle puncture, and in none was it necessary to resort to other methods.

The site and outline of the purulent effusion are determined by roentgen and physical examination. Then, under infiltration anesthesia and at a point in the intercostal space corresponding to the lowest point of the empyema cavity, a large needle attached by a stiff rubber tube to a 30- or 100-cm. Luer syringe is inserted. After the aspiration of a syringe-full of pus, the tube is clamped, the syringe is removed, emptied, and filled with air, and the air is injected into the empyema cavity. The operation is repeated until the cavity is drained or until upon aspiration, air comes through the needle. When the amount of pus is large, a smaller needle is inserted into the cavity and connected to some form of pneumothorax apparatus while the larger needle is connected with a suction outfit. The pus is then rapidly withdrawn and a corresponding amount of air is introduced. In this manner as much as 3,000 c.cm. has been withdrawn at one time without causing discomfort.

In some cases the fibrinous exudate prevents complete emptying of the cavity. Waiting a few days will usually give the exudate a chance to liquefy. In the cases reviewed, the number of aspirations varied from one to ten. The average number was four. The average amount of pus obtained varied from 100 to 300 c. cm. and accumulated in an average period of from six to eight days. If the aspiration is not immediately followed by improvement, a search should be made for other cavities.

The advantages of this method of treatment are summarized as follows:

1. There is no injury to the lung or pleura, the pleural surfaces therefore remaining free when recovery is complete.

2. The absence of drains prevents secondary infection.

3. Complete closure of the cavity prevents chronic cavities.

4. The patient is spared an operation and readily submits to repeated aspirations to escape surgical treatment.

5. Hospital and dressing expenses are saved and the patient is confined to bed for only a short period of time.

WILLIAM E. SHACKLETON, M.D.

ŒSOPHAGUS AND MEDIASTINUM

Dvorak, H. J.: *Sarcoma of the Œsophagus. Arch. Surg.*, 1937, xxii, 794.

A case of sarcoma of the cervical œsophagus is reported and the literature on the condition is reviewed.

Fewer than fifty cases of sarcoma of the œsophagus have been reported, and in only about thirty was the diagnosis proved. There are two chief types of œsophageal sarcoma, the polypoid type and the diffuse infiltrating type. The polypoid type of sarcoma contains spindle cells, is relatively benign, and rarely metastasizes. Sarcoma of the diffuse infiltrating type contains round cells and early gives rise to distant metastases. Sarcoma is a disease of advanced years, but is more frequent in the young than carcinoma. It occurs most frequently in the lower third of the œsophagus, whereas carcinoma occurs most frequently in the middle third.

Unlike carcinoma, sarcoma often causes early and severe pain. Marked emaciation may result long before appreciable stenosis. In many cases the earliest symptom is a vague sensation of pressure and constriction rather than dysphagia. As a rule the condition is wrongly diagnosed. In most of the reported cases the correct diagnosis was made only at autopsy.

Sarcoma of the cervical œsophagus has been resected successfully, but not sarcoma of the thoracic œsophagus.

The tumor reported by the author was a polypoid rhabdomyosarcoma containing muscle cells of the striated type, spindle cells, giant cells, round cells, and fibrous connective tissue. The patient was a woman twenty-seven years old. The neoplasm occurred in the cervical region 5 cm. below the lower edge of the cricoid. It was a soft, yellowish, sharply circumscribed polypoid mass from 4 to 5 cm. in diameter. It bulged partly into the lumen of the œsophagus. For one year it had caused the appearance of blood in the stools and vague epigastric pains, for which the patient had been given gastric ulcer treatment. This treatment gave relief, but after several months the patient noted a sense of constriction in the throat, difficulty in swallowing, and loss of weight. The diagnosis was made by œsophagoscopy and biopsy. Gastrostomy was performed and followed by the implantation of radium and external deep X-ray therapy. The patient died within three months after the treatment. Because of the location and the circumscribed nature of the lesion, the author believes that resection of the œsophagus would have been possible if the diagnosis had been made sooner.

HARRY C. SALTZSTEIN, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Walton, F. E., Moore, R. M., and Graham, E. A.: The Nerve Pathways in the Vomiting of Peritonitis. *Arch. Surg.*, 1931, *xxii*, 829.

Although the vomiting which accompanies peritonitis has been considered due to peritoneal irritation, proof of this has been lacking. It has been generally thought that the emetic stimulus is a nervous impulse, but the possibility of a blood-borne toxin or hormone has been considered. Such usual blood constituents as choline and histamine are known to cause vomiting when present in the blood in abnormally large amounts. In fifteen normal cats the intraperitoneal injection of 10 c. cm. of a 50 per cent turpentine emulsion produced vomiting within six seconds, a reaction time which seemingly would preclude a chemical stimulation of the vomiting center and yet be entirely within the limits of a reflex phenomenon. If the emetic stimulus is a nervous impulse, the possible pathways are the vagi, the sympathetic, and the cerebrospinal nerves which supply the peritoneum.

The authors produced peritonitis in twelve cats and seven dogs by the intraperitoneal injection of a twenty-four-hour bouillon culture of bacillus coli. Vomiting was a constant feature of the disease in these animals. Twelve other cats which received similar injections and in addition were subjected to bilateral intrathoracic vagotomy also vomited, as did five cats which received similar injections and in addition were subjected to bilateral abdominal sympathectomy and splanchnotomy and five dogs in which peritonitis was induced and the spinal cord was transected at the level of the second thoracic vertebra. On the other hand, six cats in which vagotomy, abdominal sympathectomy, and splanchnotomy were done, but the phrenic nerve and other cerebrospinal nerve paths were left undisturbed, vomited promptly when lobelin sulphate was injected intramuscularly, but did not vomit during the course of a fatal bacillus coli peritonitis. It therefore appears that bacillus coli peritonitis causes vomiting through a local irritation of afferent nerve endings, and that the emetic impulse traverses the vagal and sympathetic paths with equal facility, but does not travel over the phrenic or other cerebrospinal nerve paths.

The authors give a brief summary of our present knowledge regarding the nervous mechanism of the vomiting act, reviewing the anatomical and physiological contributions on this subject. Most anatomists agree that the parietal peritoneum is supplied chiefly by cerebrospinal somatic afferent nerves, whereas the visceral peritoneum receives its nerve supply from the vagal and sympathetic trunks. On

the basis of this theory and the results of their experiments, the authors conclude that the vomiting in peritonitis is the result of irritation of the visceral rather than the parietal peritoneum.

ALTON OCHSNER, M.D.

Marchini, F.: Abolition of Drainage in Circumscribed and Diffuse Peritonitis, Especially from Appendicitis (L'abolizione del drenaggio nelle peritoniti purulente circoscritte e diffuse, specialmente da appendicite). *Arch. ital. di chir.*, 1931, *xxviii*, 549.

Marchini reviews the literature on the normal function and defense mechanisms of the peritoneum. He presents evidence to show that the peritoneum possesses a defensive power which is greater than that of any other tissue and that this power is considerably increased by inflammatory processes, especially those produced by the bacterium coli.

He believes that abdominal drainage can be abolished not only in acute appendicitis without peritonitis, as is now generally admitted, but also in the presence of purulent peritonitis. In support of his opinion he cites 237 cases of uncomplicated acute appendicitis without peritonitis, 301 cases with localized peritonitis, and 142 cases with diffuse appendicitis which were operated upon in the hospital of Forlì in the period from 1908 to 1930. In the 25 cases of acute appendicitis without peritonitis in which the peritoneal cavity was drained there were 2 deaths, whereas in the 212 cases in which drainage was not established there were no deaths. Of the 301 cases of acute appendicitis with localized peritonitis, the peritoneal cavity was drained in 184, with 175 recoveries and 9 deaths, whereas the abdomen was closed without drainage in 117, with 115 recoveries and 2 deaths. Of the 142 cases of acute appendicitis with diffuse peritonitis, drainage was established in 101, with 70 recoveries and 31 deaths, whereas the abdomen was closed without drainage in 41, with 34 recoveries and 7 deaths.

The author discusses the appendectomy technique generally used. He believes that it is important to remove the appendix completely and to peritonize the stump so as to remove it as a possible focus of infection to the peritoneum. In cases in which the base of the cæcum is friable and inversion of the stump is inadvisable he protects the stump with appendices epiploicæ. In some cases he injects electrogel into the peritoneal cavity before closing the abdominal wall. He closes the abdominal wall without superficial drainage and then institutes the treatment usually employed for peritonitis.

As a rule the wound has healed by primary intention. In the small percentage of cases in which incisional abscesses formed, the abscesses were easily

drained. In only 2 cases was a second operation necessary for the drainage of a deep abscess in the left lower quadrant. In no case was an abscess formed in the right iliac region.

Marchini reviews the indications and contra-indications for drainage of the peritoneal cavity. In his discussion of the general indications he considers the patient's age and resistance and the degree of the intoxication. In advanced age little can be expected of the natural defense mechanisms of the body; therefore primary closure of the abdomen is not advisable in the cases of old persons. Severe intoxication and poor resistance are indications for drainage. The local indications depend upon the removal of the causative agent, the degree of reaction of the peritoneum, the occurrence of hemorrhage, and the reliability of the intestinal suture. Inadequate removal of the appendix may be an indication for drainage. Other indications are the absence of peritoneal exudation or adhesions indicative of a poor defense reaction and the oozing of blood from surfaces denuded of peritoneum.

From this study Marchini concludes that drainage of the entire peritoneal cavity is impossible. The tubular and capillary drains commonly used drain only a limited area and are often the cause of grave disturbances and injury. The author agrees with Solieri that the defensive capacity of the peritoneum is probably due to a local immunity. He has found that the peritoneum which is already infected or is stimulated by artificial means defends itself much better than the normal peritoneum. The abscess that forms in the superficial layers of the abdominal wall after the peritoneum has healed demonstrates that the general defensive mechanism is inadequate to defend all of the tissues, whereas the local reaction of the peritoneum or local immunity is sufficient to overcome the peritonitis. PETER A. ROST, M.D.

GASTRO-INTESTINAL TRACT

Christensen, O.: The Pathophysiology of Hunger Pains; Gastrographic and Titrimetric Investigations. *Acta med. Scand.*, 1931, Supp. xxxvii.

The investigation reported in this monograph was carried out to determine the relation of the so-called hunger pains occurring at varying periods after the ingestion of food in cases of ulcer to the degree of motor activity and the degree of acidity of the stomach.

The technique was very similar to that used by Carlson. The patient swallowed a balloon attached to a kymograph on which all gastric contractions were registered. At the same time, another tube was passed into the stomach to serve for gastric analysis. Pain was registered on the kymograph by a change in the position of a marker when the patient pressed an electric button.

In normal controls, Christensen found no relationship between hunger sensations and contractions of the emptying stomach, but noted that when a sufficient amount of stomach contents—fluids,

solids, or gastric secretion—was present the contractions were decreased. He failed also to find any relation between the different phases of "hunger" contractions and variations in the acidity of the gastric secretion, but noted that meals rich in protein or fat gave the longest period of rest.

In the sixteen cases of peptic ulcer reviewed, in which forty-two gastrographic examinations were made, there was a distinct relation between the hunger pains and vigorous contractions of the empty or nearly empty stomach as contrasted with the normal controls. However, pain was sometimes present when the contractions were no more vigorous than normal. When the pain was relieved by food, the adequate stomach contents substituted rest for vigorous gastric contractions. The adequate stomach contents may be acid, alkali, ingested food, or gastric secretion. The acidity of the stomach contents bore no relation to the varying capacity of vigorous stomach contractions to produce cardialgia.

The author's conclusions are supported by detailed kymographic records and repeated fractional gastric analyses, which make this monograph of value to the clinician as well as to the physiologist.

SAMUEL J. FOGELSON, M.D.

McClure, C. C.: Hypertrophy of the Pyloric Muscle in Adults. *Surg., Gynec. & Obst.*, 1931, lli, 945.

Hypertrophy of the pyloric muscle in adults is responsible for severe and protracted symptoms and sometimes may result in death.

The condition was first discussed by Maier in 1885, but its cause is still unknown. Some contend that it is a continuation of the congenital stenosis of infancy, and others that it has an endocrine basis. The author believes that it may be the result of long-standing spasticity of the pyloric muscle. Pirie attributes it to hyperadrenalism inhibiting the secretory stimulation of the pancreas and thereby delaying neutralization of the acid chyme from the stomach and causing gastric retention and acidity from prolonged closure of the pylorus.

McClure reports four cases. Two appeared to be of the congenital type as the symptoms had been present from early life. In the two others, the condition may have been related to ulcer as in one of them an ulcer developed after operation and in the other there was pathological evidence of a healed lesion which may have been an ulcer.

The first case was that of a woman fifty-five years of age who complained of goiter, heart disease, dyspnea, edema, coughing spells, nervousness, poor appetite, and loss of weight. Shortly before she entered the hospital for treatment and before there was an opportunity to make a gastro-intestinal examination, she died suddenly of myocardial degeneration and decompensation. Autopsy revealed chronic cholecystitis with cholelithiasis, acute diffuse appendicitis, and hypertrophy of the pyloric muscle. The stomach was considerably contracted. The gastric mucosa was grayish and velvety and showed normal rugae. No scars or ulcers were found. The

pyloric ring was markedly thickened and the gastric musculature was hypertrophied throughout the fundus. Microscopic examination of the pylorus disclosed thickening of the muscular coat, a few small areas of lymphocytic infiltration around the blood vessels, and a slight increase of fibrous tissue in the lower layers of the mucosa.

The second case was that of a woman thirty-six years of age who gave a history of life-long indigestion which had become more severe during the last ten years. During the last three years she had had epigastric pain which usually developed immediately after meals and was relieved by vomiting. She had lost 65 lbs. Roentgen examination revealed a filling defect of the pars pylorica which suggested carcinoma. Operation disclosed marked thickening of the inferior portion of the pyloric ring. The pathological report was chronic gastritis and hypertrophy of the muscular coat in the pyloric region. Partial gastrectomy with posterior gastrojejunostomy was followed by cessation of the gastrointestinal symptoms and a gain of 43 lbs. in fifteen months.

The third case was that of a woman forty-four years of age who had suffered practically all her life from constipation and indigestion and for two years from extreme distention and discomfort in the abdomen and slight tenderness in the midepigastrium which came on about three hours after meals. Relief had previously been obtained from food and alkalies. The first X-ray diagnosis was gastric ulcer. Later a diagnosis of congenital duodenal adhesions was made. Operation disclosed an irregular thickening of the pylorus. Partial gastrectomy with posterior gastrojejunostomy was done. Sixteen months later the patient developed symptoms which led to a diagnosis of marginal ulcer.

The fourth case was that of a man forty-five years of age who complained of intermittent attacks of epigastric pain which began at the age of twelve years, occurred between meals, and were sometimes accompanied by nausea and vomiting. The Sippy diet brought no relief. The X-ray diagnosis was duodenal ulcer without obstruction. The findings at operation suggested a large ulcer, but the pathological report was cicatricial stenosis of the pylorus and hypertrophy of the pyloric muscles.

In nine cases reported from the literature the symptoms were soreness of the abdomen, nausea, vomiting, and loss of weight. In none of these cases was there a palpable mass in the abdomen. The pre-operative diagnoses were carcinoma, ulcer, colitis, and chronic appendicitis. The findings of gastric analysis varied from anacidity to hyperacidity. Blood was found only twice. In no case was an ulcer discovered at operation.

In discussing the diagnosis the author says that when pyloric spasm is produced by hypertrophy of the pyloric muscle atropin will not cause complete disappearance of the pyloric constriction.

NORMAN G. PARRY, M.D.

Pitkin, G. P.: A New Treatment of Peptic Ulcer. *Am. J. Surg.*, 1931, xii, 466.

Pitkin makes a preliminary report of a new treatment of peptic ulcer which consists of intravenous injections of foreign proteins derived from non-pathogenic schizomycetes together with lipoids, animal fats, and emetin. Of 127 cases treated by this method, pain was relieved in 76 after the first injection and in 16 after the second injection. In only 4 cases was there no relief after several injections. The beneficial effect of the treatment was demonstrated also by the findings of X-ray examination and gastric analysis. ELIZABETH CRANSTON.

Walton, A. J.: Surgical Treatment of Simple Ulcers of the Body of the Stomach. *Lancet*, 1931, ccxx, 1070.

When gastric ulcer was treated medically, improvement resulted in the majority of cases, but in a large number the symptoms returned and there was a high mortality from hæmorrhage and perforation. Surgical treatment therefore became somewhat overenthusiastically advocated. There is considerable difficulty in comparing medical and surgical treatment. Most of the cases which the surgeon sees represent medical failures, but are undoubtedly only a small percentage of the total number treated medically, whereas the cases of surgical failure which are seen by physicians constitute only a small number of the cases treated surgically. The late end-results in a large series of cases treated medically have never been reported although the number of five-year surgical cures is fairly accurately known.

Walton agrees with Kinsella that the pain depends upon local tension due to an acute inflammatory change. It is to be expected that medical treatment would relieve the symptoms because it decreases the inflammation. Very severe, persistent pain is evidence of a deeply penetrating ulcer which has involved the substance of the pancreas. In cases with pain of this type medical treatment nearly always fails and is contra-indicated. In cases of chronic callous ulcer with much fibrosis, which resist non-surgical measures, medical treatment may result in sufficient improvement to make surgical treatment easier and more effective. Frequent and rapid recurrences during medical treatment may justify surgical intervention. Moreover, prolonged medical treatment may prove so irksome to the patient that he chooses to submit to surgery.

The greatest dangers of peptic ulcer are perforation and hæmorrhage. Perforation is an unquestioned indication for immediate operation. Simple suture is not sufficient as it is usually followed by recurrence of the symptoms. In the presence of repeated or continued hæmorrhage operation should be performed immediately after or during a blood transfusion. Walton summarizes the indications for operative treatment as follows: severe pain indicating penetration of the ulcer; failure of medical treatment; a fibrosed and callous ulcer; inability

of the patient to continue medical treatment; perforation; severe or repeated mild hemorrhage; distortion, especially hour-glass deformity; and the slightest suggestion of carcinoma.

Of the possible surgical procedures, gastro-enterostomy is perhaps the least used and the least satisfactory. Of 57 of Walton's cases of chronic gastric ulcer treated by gastro-enterostomy, the ulcer persisted in 7. Occasionally, in the cases of debilitated patients, gastro-enterostomy may be done as a preliminary operation, and gastric resection performed later when the general condition has improved.

The operation most frequently performed for ulcer of the body of the stomach is partial gastrectomy. Such a resection removes both the ulcer and the ulcer-bearing area of the stomach. Following this operation recurrence of ulcer is rare (once in 59 of Walton's cases), and the occurrence of gastrojejunal ulcer is infrequent (4 times in Walton's 59 cases). A distinct disadvantage of partial gastrectomy is the resection of a large portion of normal stomach to remove the ulcer. This may give rise to pernicious anemia. Walton believes that the value of this method in preventing carcinoma has been exaggerated. Of 306 of Walton's cases in which a local excision of the ulcer was done without partial gastrectomy, cancer developed in relation to the previous ulcer site in only 1 and carcinoma was found in the locally removed ulcers in none. Occasionally in cases with large adherent ulcers partial gastrectomy is an easier procedure than local excision because the adherent area can be more easily approached. Local excision of the ulcer followed by gastro-enterostomy has a low mortality and is successful in a high percentage of cases. The cautery excision of Balfour has the disadvantage that the edges which are left to unite are formed of injured tissues. Removal of the ulcer with knife and scissors is free from this disadvantage. Walton advocates local resection and gastro-enterostomy. In 224 cases in which he performed this operation there was only 1 recurrence, and in those which were followed for five years the incidence of cure was 88 per cent.

EARL GARSIDE, M.D.

Tønnesen, H.: Gastro-Intestinal Polyposis. A Clinical Study of Danish Cases During the Last Twenty Years (Polyposis gastro-intestinalis. Eine klinische Studie ueber daenische Faelle aus den letzten 20 Jahren). *Acta chirurg. Scand.*, 1931, lxxviii, Supp. xvii, 11.

The author reviews forty cases of gastro-intestinal polyposis. Twenty-seven of the patients were men and thirteen were women. In discussing the incidence of the condition, he states that undoubtedly many cases are not diagnosed, in others death results from an intercurrent disease, and in others a cancer developing from the intestinal polyposis is erroneously considered to be the basic disease.

In fully developed cases, in which the entire intestinal or gastric mucous surface is covered with

polyps, the condition is easily diagnosed by macroscopic and microscopic study. Both examinations must be made because ulcerative colitis may present the same macroscopic picture as polyposis. When just a few polyps are found it is often impossible to decide at first whether the condition is only the association of single polyps or a polyposis. However, this may be determined from the clinical course. The diagnosis of polyposis is not warranted by the presence of five or six polyps; it is indicated only by a diffuse distribution of polyps in different stages of development and the presence of adenomata.

In all of the cases examined more or less pronounced inflammatory processes were found. The author attributes the disease to a hereditary cellular predisposition and chronic inflammation. He believes that the predisposition may vary in intensity (dominant factor), and that the disease is dependent upon a certain relationship between the hereditary anlage and external conditions.

In 82.5 per cent of the cases reviewed the polyposis occurred in the rectum. In 12.5 per cent the stomach was involved. In the intestines, the polyps are most numerous at the flexures. Polyposis may spread from the caecum into the appendix. In rare cases the appendix is the only site of the condition.

From the morphogenetic standpoint, the author distinguishes three main types of epithelial polyps: (1) the glandular polyp, (2) the superficial polyp, and (3) the combination polyp. The rectal polyp frequently found in children is a conglomeration of retention cysts. Tønnesen urges that "pseudopolyposis," "true polyposis," and "false polyposis" be replaced by adequate pathological designations.

In 65 per cent of cases, carcinoma develops on the basis of polyposis.

Gastric polyposis should be considered a chronic hypertrophic and atrophic gastritis. The author has observed cell transitions which seem to show that the metaplastic intestinal cells in the stomach develop from atypical epithelial cells. It appears also that the metaplastic intestinal cells are further differentiated, losing their secretory function and becoming invasive and destructive.

The ratio of males to females affected by the disease is 1.8 : 1.

The symptoms are usually of very long standing, sometimes having been present for years. Remissions are common. The symptoms are not pathognomonic; they often resemble those of acute and chronic colitis. The chief symptoms are hemorrhage, diarrhoea, and pain, and occasional obstipation. They may develop slowly during a course of years, but may also appear suddenly and show transition forms. The stools may contain a large amount of mucus. In some cases prolapse of the rectum may result. The symptoms of acute enterocolitis are usually more pronounced the nearer the polyposis is to the anus. The author cites a case in which invagination occurred. About 70 per cent of persons with polyposis die from cancer, with the symptoms of the latter disease. Other symptoms include un-

usual lassitude, anorexia, and emaciation. Anæmia is not an early symptom.

The symptoms of gastric polyposis resemble those of chronic gastritis, but occasionally there are vague and indefinite symptoms such as slight cardialgia, nausea, and vomiting. As a rule the appetite and state of nutrition are well maintained. Sometimes there are more serious symptoms such as melæna, hæmatemesis, diarrhœa, and emaciation. There are no pathognomonic symptoms. Achylia is always present, and sometimes there is simultaneous retention. Gastric lavage reveals blood and particles of mucus, which may establish the diagnosis. The course of the disease varies considerably. The patient may die of another disease and the polyposis may be found only at autopsy. Carcinoma may develop on the basis of gastric polyposis.

If intestinal polyposis is thought of, it is easily diagnosed by rectal exploration and rectoscopy. The symptoms of colitis or the finding of macroscopic or occult blood should suggest its presence. As a rule there is a long history of chronic diarrhœa and a familial history of cancer. Digital exploration of the rectum, rectosigmoidoscopy, roentgenography, and exploratory laparotomy are indicated.

As the disease is remittent and the attacks may recur over a period of years, during which time the patient is able to follow his calling, conservative therapy is usually given. Conservatism seems justified because of the high mortality of operation and the hopeless findings at examination after radical operations. Radical operation should be undertaken when intestinal cancer is discovered and when internal therapy is no longer followed by remissions. When the patient is greatly affected by the disease, radical operation should be undertaken only when palliative operations have proved beneficial. Gastric polyposis should be attacked radically as soon as it is diagnosed. As yet nothing definite can be said regarding radium therapy. LOUIS NEUVELT, M.D.

Cunningham, W. F.: Partial and Subtotal Gastric Exclusion. *Ann Surg.*, 1931, xciii, 1167.

For chronic ulcers of the posterior wall of the duodenum the author advocates pyloric exclusion and Polya anastomosis. He reports experimental evidence showing that the excluded portion immediately contracts and the glands producing hydrochloric acid undergo degeneration and are replaced by fibrous tissue. JACOB M. MORA, M.D.

Meyer, J., and Rosenberg, D. H.: Primary Carcinoma of the Duodenum: Report of Four Cases, with a Review of the Literature. *Arch. Int. Med.*, 1931, xlvii, 917.

In reporting four cases of primary carcinoma of the duodenum the authors emphasize the difficulty of recognizing the condition clinically. They suggest that if a careful clinical and histological study were made in all cases of duodenal stenosis, primary duodenal carcinoma might be found more frequently. JOHN J. MALONEY, M.D.

Morrin, F. J.: Spontaneous Perforation of Primary Jejunal Ulcers. *Irish J. M. Sc.*, 1931, 6 s., 198.

Primary jejunal ulcer is an ulcer of the mucosa and deeper layers of the small intestine which is usually single and resembles in its appearance, pathological development, clinical manifestations, and complications the peptic ulcer of the stomach and duodenum. In the last five years Morrin has operated upon three cases of perforated jejunal ulcer. In the first two cases an error in diagnosis was a factor in the fatal outcome. In the third case, the affected loop of bowel was easily identified and satisfactorily treated. In none of the cases was there any evidence of a specific cause such as tuberculosis, syphilis, actinomycosis, or malignant disease.

The diagnosis is seldom made before operation. The treatment consists in simple suture of the affected segment of bowel and drainage of the abdominal cavity. When laparotomy reveals free peritoneal exudate and exploration of the appendix and stomach region is negative, the small and large bowel should be examined.

The occurrence of perforation is a grave surgical emergency as the high bacterial content of the small bowel renders the resulting peritonitis extremely severe. JOHN W. NUZZUM, M.D.

Bolognesi, G.: Stenosing Tumors and Pseudotumors of the Right Half of the Colon (Tumori e pseudotumori stenosanti dell'emicolon destro). *Arch. ital. di chir.*, 1931, xxviii, 473.

Bolognesi reports six cases of stenosing tumor of the right half of the colon. The neoplasms included three carcinomata, a leiomyoma, a tumor due to hyperplastic tuberculosis, and a so-called aspecific granuloma. Each case is reported in detail and each type of tumor is discussed.

The leiomyoma was found in a man thirty-four years of age who for twelve years had had attacks of right lumbar pain associated with fever, nausea, and vomiting which suggested a pathological process in the urinary tract. At examination, the urinary tract was found normal, but a firm irregular tumor mass was discovered in the right lower quadrant of the abdomen. Roentgen examination showed the neoplasm to be a constricting lesion of the ascending colon. A diagnosis of carcinoma was made. After a preliminary colostomy, the tumor was resected by removing the right half of the colon. The continuity of the gut was re-established by ileotransversostomy. The patient made an uneventful recovery.

Examination of the resected tumor showed that it arose from the muscular layers of the posterior wall of the ascending colon and protruded into the lumen so as to produce obstruction. The mucosa was not involved. On microscopic examination, the tumor was found to be an intramural leiomyoma with scattered areas of calcification.

The case of so-called aspecific granuloma was that of a man aged sixty years. For twenty months the patient had had attacks of pain in the right lower

quadrant of the abdomen which were followed by periods of constipation and diarrhoea. There had been no colic or melena. A round firm mass was palpated in the right lower quadrant. Roentgen examination revealed an annular constricting lesion involving a portion of the cæcum and ascending colon. A diagnosis of carcinoma was made. At operation, the right half of the colon was removed and an ileotransversostomy was done in one stage. The patient made a smooth recovery.

Pathological examination of the excised bowel revealed a moderately stenosing annular tumor in the cæcum and ascending colon which involved the mucosa and submucosa with the formation of papillary growths protruding into the lumen of the colon. There was no ulceration of the mucosa. Histological examination of the tumor disclosed an irregular arrangement of loose and firm connective tissue and granulosomatous tissue consisting of mononuclear and polymorphonuclear leucocytes and plasma and epithelial cells distributed irregularly between the connective tissue bundles. No giant cell, tubercle bacillus, or spirochæta pallida was found. The only diagnosis the author could make was "aspecific granuloma of unknown etiology." Bolognesi reviews similar cases from the literature.

In conclusion the author states that tumors of the right half of the colon giving rise to palpable masses and the clinical signs of stenosis may be malignant or benign tumors or pseudotumors such as the tuberculous or aspecific granulomata. The differential diagnosis is difficult even with the aid of the roentgen ray. Surgical removal of the neoplasm, preferably by right hemicolectomy, is the treatment of choice.

PETER A. ROSI, M.D.

Del Valle, Brachetto-Brian, and Yódice: Tumors of the Cæcum and Colon (Consideraciones anátomo-clínicas y quirúrgicas sobre tumores del ceco-colon). *Arch. argent. de enferm. d. apar. digest.*, 1931, vi, 463.

Four cases of tumor of the cæcum and ascending colon are reported. Roentgen examination is of great value in the localization of such tumors. In the authors' cases the patient is prepared for operation with purgatives and enemas and the injection of glucose solution. Operation may be performed under ether or spinal anesthesia. For cases of chronic obstruction the authors prefer hemicolectomy with ileotransversostomy. In cases of acute obstruction they vary the technique. They describe the operation and show it by illustrations. They emphasize the importance of preserving a good blood supply to both stumps, making the incision in sound tissue, mobilizing the stumps, fitting the two ends together perfectly, and covering the site of anastomosis with omentum. The ileotransversostomy is the chief stage of the operation.

The postoperative treatment includes blood transfusions and the administration of glucose solution. In addition, an ice bag should be applied to the abdomen for, in spite of a good technique, peritonitis

may develop from perforation of the anastomosis. If peritonitis occurs, the abdomen should be opened immediately and drained.

AUDREY G. MORGAN, M.D.

Ragnotti, E.: Experimental Investigations on the Motor Function of the Appendix Under Normal and Pathological Conditions (Ricerche sperimentali sulla funzione motoria dell'appendice in condizione normali e patologiche). *Arch. ital. di chir.*, 1931, xxvii, 209.

From studies of fifty-six human appendices, ten of which were removed at operation and ten of which were normal, the author draws the following conclusions:

1. Even under normal conditions, the human appendix does not have a peristaltic movement.

2. Even under normal conditions, the motor activity of the appendix has only a weak expulsive action on the appendiceal contents.

3. The activity of the longitudinal musculature alone, although sometimes rather pronounced, has no expulsive action on the contents of the appendix, even under normal conditions.

4. The motor function of the human appendix may be considered rudimentary.

5. While no constant relationship can be established between the anatomopathological findings and the motor activity of the appendix, the appendices attacked by inflammation are those in which automatic motility is most compromised or is entirely absent.

6. Even with the strongest chemical and physical irritants it is impossible to provoke expulsive contractions.

On the basis of these findings, which show that, even under normal conditions, the exchange of contents between the appendix and cæcum is extremely slow and defective, the author concludes that functional stagnation of the contents of the appendix may be a factor predisposing to inflammation of the organ. This is increased by a furrowing of the mucosa (Aschoff) and by anatomical causes of stasis, physiological or pathological.

Only one of the appendices examined by the author microscopically showed the picture upon which Kretz based his hæmatogenous theory of appendicitis.

MARGUERITE P. SLOAN.

Bower, J. O.: Acute Appendicitis: A Survey of Its Incidence and Care in Philadelphia. *J. Am. M. Ass.*, 1931, xcvi, 1461.

In the United States the mortality from acute appendicitis in the period from 1913 to 1923 was 22.3 per cent; in Philadelphia it was 18 per cent. This report is based on 5,121 cases of acute appendicitis treated in 27 Philadelphia hospitals.

The average time that elapsed between the onset of the symptoms and the operation was sixty-one and seventeen-hundredths hours. Local peritonitis was the cause of 19.5 per cent of the deaths, and general peritonitis the cause of 80.5 per cent.

It is commonly believed that there is no mortality in appendicitis if the operation is performed early, but this survey shows that 1 patient in every 39 died after an operation was performed within twenty-four hours after the development of the symptoms, 1 in 17 when it was performed within forty-eight hours, 1 in 13 when it was performed within seventy-two hours, and 1 in 9 when it was performed after twenty-two hours. In the cases of the patients who died the average time that elapsed between the onset of the symptoms and the operation was sixty-one-tenth hours, and in the cases of those who died, ninety-seven and seven-tenths hours. In 99 cases out of 100 a patient in good physical condition died if he is operated upon within the first twelve hours.

In cases in which the inflammation of the appendix subsides to recur later the mortality is higher than in those in which operation is performed in the initial attack.

Without exception, the patients who developed a perforation with fulminating peritonitis before twelve hours had been given a laxative. Delay of operation and the administration of a laxative caused most of the deaths. When a patient with a fulminating peritonitis is given a laxative and develops general peritonitis he has only 1 chance in 7 of recovering. Pain is the only symptom which is always present in acute appendicitis. Tenderness is present in about 90 per cent of the cases and leucocytosis in about 80 per cent. Appendicitis is most common between the ages of eleven and twenty years.

CHARLES F. DuBOIS, M.D.

Maquet, P., and Gally, L.: The Roentgen Diagnosis of Chronic Appendicitis (Le diagnostic radiologique de l'appendicite chronique). *Presse méd.*, Par., 1931, xxxix, 376.

Six hours prior to the roentgen examination described, the patient is given 250 gm. of barium suspended in 250 c.cm. of soup or coffee. By the end of six hours, if the appendix is normal, the cecum will be found filling the colon as far as the hepatic flexure and only a small residue will be seen in the ileum. In persons who have had appendicitis for two or three months, there is retardation of the ileocecal flow and at the end of six hours as much barium will often be found in the ileum as in the cecum. The retardation of the ileocecal flow is due to a localized, transitory spasm which the authors believe is diagnostic of appendicitis. This spasm is unlike the obstruction caused by an organic lesion. It may occur in the ileocecal region, the cecum, and the ascending colon. On the external border of the cecum, opposite the point of tenderness, there is a deep incision similar to the incision opposite a duodenal or gastric ulcer. Manual compression intensifies the spasms.

The authors have used this method in many cases of supposed chronic appendicitis and have been able to confirm the roentgen diagnosis by the findings after operation.

JAMES B. MASON, M.D.

Pellé, A., and Follissson, A.: Appendicitis and Typhlitis (Appendicite et typhlite). *Rev. de chir.*, Par., 1931, I, 146.

The authors report three cases which presented symptoms of generalized peritonitis from appendicitis so severe as to necessitate an emergency operation. The appendix was found to be normal or to show only microscopic evidences of an ordinary inflammation, but the cecum was markedly abnormal in all cases. In Case 2 the wall of the cecum was thickened and oedematous, and in Cases 1 and 3 it presented a gangrenous spot between the anterior and postero-external longitudinal bands.

In the first case the treatment consisted of appendectomy, resection of the gangrenous spot, and drainage with drains wet with anti-gangrene serum; in the second, of appendectomy without drainage; and in the third, of appendectomy, burying of the gangrenous zone, and closure without drainage. Uneventful recovery resulted in all.

After a discussion of the theories regarding the pathogenesis of cases of this type, a number of which are cited from the literature, the authors conclude that the appendiceal condition is secondary to arteritis, phlebitis, or lymphangitis, and that the lesions in the cecum are caused by embolism. No routine treatment can be given. The operation must be adapted to the requirements of the particular case.

AUDREY GOSS MORGAN, M.D.

Michaëlsson, E.: Two Cases of Pseudomyxoma of the Peritoneum and Appendix (Zwei Fälle von Pseudomyxoma peritonei et processus vermiformi). *Acta chirurg. Scand.*, 1931, lxxviii, 25.

The author reports two more cases of pseudomyxoma of the peritoneum and the appendix which he has operated upon. In both, the course of the condition was slow and insidious and the chief sign was marked distention of the abdomen. The diagnosis was made before the operation. In only one of the cases was the appendix found at operation. In the other, it was not found until autopsy. In both cases death occurred within one or two years. The proximal end of the appendix was obliterated and its distal end dilated. The hydropathic part presented a small perforation which in one case was lined by mucous membrane that was continued on the outer side. The gelatinous masses which in both cases almost completely filled the abdomen consisted of a network of connective tissue strands, mucus, and large quantities of epithelial cells, some of which were of the cylindrical type and others of the columnar type. The epithelial cells formed long strands or lined cavities. There was no invasive tendency.

The author finds in these cases and the results of experimental investigations carried out by Naeslund further support for his theory that appendicular epithelia may become implanted in the abdomen and proliferate at a considerable distance from the primary focus. He concludes also that pseudomyxoma of the peritoneum and appendix may be com-

pared to the abnormal proliferation of normal epithelium which occurs in traumatic epithelial cysts and cysts of the anterior chamber of the eye. He states that the prognosis in pseudomyxoma of the peritoneum and appendix with epithelial dissemination is often doubtful although the condition is not malignant.

Hiller, R. I.: The Anal Sphincter and the Pathogenesis of Anal Fissure and Fistula. *Surg., Gynec. & Obst.*, 1931, lii, 921.

The author reports anatomical studies of the anal sphincters of twelve adults and a child of eight years. The coccyx, perineum, and pelvic organs were removed *en masse* and the vessels, fascia, and muscle fibers dissected out. In five of the specimens the arteries were injected with a gelatine-dye solution.

A detailed study of the anatomy and physiology of the anal sphincters served to explain the pathogenesis of anal fistula, abscess, fissure, and post-operative incontinence. The almost constant location of the opening of anal fistulae at points corresponding to the 5 and 7 on the face of a clock is explained by the arrangement of the vessels in the anal triangle. The infection follows the perivascular spaces. While the anatomy of the external sphincter alone does not explain the origin of fissure, it is evident that the great accumulation of fibro-elastic terminations of longitudinal bowel fibers fixing the anterior and posterior commissures is a factor. Incontinence following incision of the external sphincter may be accounted for by the anatomy of this sphincter, for when its influence is removed the efficiency of the internal sphincter becomes reduced because the mechanical stimulus necessary for maintenance of resistance to a dilating force is lacking. JOHN W. NUZUM, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Pepl, O.: Biliary Peritonitis Without Perforation (Contributo allo studio delle peritoniti biliari senza perforazione). *Arch. ital. di chir.*, 1931, x, 410.

The author reports a case of biliary peritonitis in a patient nineteen years of age. The gall bladder was not perforated. Its walls were slightly thickened and oedematous, but normal in color. The bile in the gall bladder was darker and more viscid than that in the peritoneal cavity. On culture, the gall-bladder bile and the peritoneal fluid yielded colon bacilli. The peritoneal fluid showed an intense bile-pigment reaction.

After discussing the various theories regarding the pathogenesis of such cases, the author concludes that the condition is caused by temporary occlusion of Vater's papilla by a stone which is not found on operation. In the case reported, cholecystectomy and drainage were followed by recovery. The presence of bacilli in the peritoneal effusion and gall-bladder bile suggested that infection was a factor.

The lesions of the gall bladder in this case were in the beginning stage, probably because the injurious action of the pancreatic ferments on the gall-bladder wall had been exercised for only a short time and was not very intense. If operation had been delayed, the changes would have been more serious and probably in time would have caused perforation. AUDREY GOSS MORGAN, M.D.

Popper, H. L.: The Etiology of Biliary Peritonitis Without Perforation (Zur Entstehung der perforationslosen galligen Peritonitis). *Zentralbl. f. Chir.*, 1930, p. 2837.

The author reports a carefully studied case of biliary peritonitis without perforation in a man fifty-one years of age. Laparotomy revealed a large amount of biliary exudate in the abdominal cavity and fat necrosis in the omentum, especially in the region of the gall bladder. The gall bladder was greatly enlarged and oedematous. The common duct was dilated to the thickness of a thumb. No adhesions were found. The pancreas was not markedly changed. No stones could be discovered in the biliary passages. Cholecholestomy was done. The papilla at first resisted the sound. Cholecystectomy and drainage of the common duct were done. During convalescence there was a transitory icterus. The patient recovered. Diastase was discovered in the gall bladder as well as in the sterile peritoneal exudate. Trypsin was also found in the gall bladder, but its presence in the peritoneal exudate was not certain. On the twelfth day, pancreatic secretion appeared temporarily in the bile.

When a common duct stone becomes incarcerated in the papilla biliary stasis results with marked distention of the gall bladder and the rest of the biliary tract. As the biliary tract and pancreas have a common outlet, the pancreatic secretion then overflows into the biliary passages. The admixture of pancreatic secretion renders the bile diffusible and as a result of the increased secretory pressure caused by the closure of the papilla, the bile is forced through the dilated gall bladder into the abdominal cavity.

The author reviews the publications of Clairmont and Haberer in 1910, Blad in 1918, Seifert in 1923, Schoenbauer in 1924, Bundschuh in 1927, and Ruppner in 1928. JASTRAM (Z).

Krieger, H.: Bromsulphthalein Used in the Study of Liver Function in Surgical Cases (Das an einem chirurgischen Patientenmaterial als Leberfunktionsdiagnostikum angewandte Bromsulphthalein). *Acta chirurg. Scand.*, 1931, lxxvii, 105.

In the cases of 20 normal persons no more than a trace of bromsulphthalein was found in the blood serum by Rosenthal's test half an hour after the intravenous injection. The maximum simultaneous icterus index determination by Meulengracht's method was 6. The urine was free from urobilin.

In the cases of 127 patients, 64 of whom had gall stones, the retention of 20 per cent or more of bromsulphthalein at the end of half an hour was

regarded as definite proof of the presence of liver disease, and the retention of from 5 to 10 per cent was regarded as suggestive of such disease.

Rosenthal's test proved to be positive in all but 1 case in which liver disease was suspected. In the milder forms of liver lesions it seemed to be very much more sensitive than the Schlesinger and Meulengracht tests, and during convalescence it became negative much later than the latter tests.

In the cases of normal persons, bromsulphthalein is excreted in the urine in quantities averaging 1 per cent. In disease of the liver it is often excreted in large amounts.

The kidneys are able to excrete bromsulphthalein even when they are severely diseased.

The author suggests that high bromsulphthalein retention in the blood may be due to marked renal insufficiency.

Bromsulphthalein can be recovered in the bile of patients with slight liver disease from forty-five minutes to one and a half days after its intravenous injection. In cases of advanced liver disease its excretion begins later and lasts longer.

Experiments on rabbits and diffusion experiments indicated no particular affinity of bromsulphthalein for all tissues except those of the reticulo-endothelial system.

Walters, W.: Obstructive Jaundice: Its Surgical Aspects. *Ann. Surg.*, 1931, xciii, 1137.

In cases of obstructive jaundice it is of primary importance to determine whether the obstruction is due to a non surgical lesion within the liver or to a surgical, removable lesion in the bile ducts. In most instances this is not difficult. In cases of intrahepatic jaundice there is usually no pain. The general condition may be good, considering the depth of the jaundice or very poor because of terminal stages of atrophy of hepatic cells. The presence of bile in the intestinal contents can be determined most accurately by non-surgical drainage with the Lyon tube. In 86 per cent of cases of obstructive jaundice due to stones there is a definite history of biliary pain or colic. The jaundice is variable, it usually appears immediately following the colic, and frequently is accompanied by chills and fever. In the presence of carcinoma of the head of the pancreas obstructing the common bile duct and of stricture of the common bile duct, the occurrence of pain is determined by the degree of the obstruction and the amount of infection in the biliary passages.

Observation for a few days in the hospital prior to operation is of definite advantage in obstructive jaundice. It gives an opportunity for a regimen of pre-operative preparation to be carried out and for the progress of the jaundice and the condition of the patient with painless jaundice to be evaluated, thereby facilitating the decision as to the necessity for operation.

The intravenous administration of a solution of calcium chloride is of definite value in these cases

for the prevention of postoperative hæmorrhage. The van den Bergh test is indicated to determine the progress of the jaundice as it is unwise to operate on patients whose jaundice is increasing unless operation cannot be delayed. A coagulation time of more than ten minutes is not a contra-indication to operation, but usually indicates that considerable injury has been done to the hepatic cells. Marked injury to the hepatic cells is evidenced also by the presence of subcutaneous hæmorrhages or petechiæ. In such cases, in addition to the solution of calcium chloride, a blood transfusion should be given prior to operation and repeated as often after operation as is necessary to control the bleeding.

Although general anaesthesia allows good exposure of the biliary passages, spinal anaesthesia has been adopted for most patients with obstructive jaundice because, in addition to giving perfect relaxation and permitting excellent exposure of the biliary passages, it is associated with less operative reaction and does not have the irritating effect of a general anaesthetic on the parenchymatous cells of the liver and kidney.

In most cases in which stones are present in the common bile duct the stones may be felt by grasping the duct between the thumb and forefinger. The best probe is the finger, and if the size of the duct permits, the finger should be used to be sure that no stones are overlooked. After the removal of the stones from the common duct, a T-tube or catheter should be employed, depending upon the desired duration of drainage of the duct. If there is infection in the liver or in the head of the pancreas, it is best to use a T-tube and to leave it in place for three weeks or longer. Otherwise a catheter, described by Mayo-Robson as a hepaticus drain, serves admirably to relieve intraductal pressure and is easily removed on the twelfth day following the operation.

If a stricture of the common bile duct is present and there is sufficient normal duct above the stricture to allow anastomosis between this normal portion of the duct and the duodenum, a good result may be expected.

In some cases in which the stricture is localized and small, the section of the duct containing it can be removed readily and the continuity of the duct restored by end-to-end anastomosis.

Obstructive jaundice due to a tumor at the head of the pancreas can be relieved by anastomosing the distended gall bladder to the duodenum or stomach, depending upon which can be done more easily and with less tension. If the anastomosis is made to the stomach, the presence of bile in the stomach does not produce unusual symptoms. There is no doubt that some tumors at the head of the pancreas are the result of infection, and that relief of the obstruction by cholecystenterostomy gives permanent relief.

Walters believes that when the jaundice is extreme, cholecystenterostomy can be done more safely in two stages than in one stage. He first

drains the gall bladder and from twelve to fourteen days later makes an anastomosis between the gall bladder and the stomach or duodenum.

The complications which occur following operations on patients with obstructive jaundice are hemorrhage and renal and hepatic insufficiency. Of great importance in lessening the incidence of post-operative hemorrhage is the selection of the proper time for operating and the pre-operative use of some measure favoring coagulation of the blood. A successful outcome is absolutely dependent upon relief of the obstruction.

Walters believes it is worth while to administer a 10 per cent solution of glucose intravenously to jaundiced patients subsequent to operation as often as such treatment is indicated. At the time that the needle is inserted into the vein for the injection, a small amount of blood may be removed for determination of the coagulation time, a change in the degree of the jaundice, and the concentration of urea in the blood.

Dawson of Penn, Lord: Hæmolytic Icterus. *Brit. M. J.*, 1937, i, 922, 963.

The features of hæmolytic jaundice bring us in contact with the problems of the origin and fate of the blood and bile and the functions of the marrow, liver, and spleen. In the higher mammals, bile pigment, unlike bile salts, is formed chiefly outside of the liver.

By isolating or removing the liver in dogs, Whipple and Hooper in 1913 and Mann and his associates in 1921 demonstrated that bilirubin is of extrahepatic origin. Mann discovered bilirubin in the plasma after removal of all of the abdominal organs. By means of the spectrophotometer, it has been found that the venous blood traveling from the marrow and spleen contains more bilirubin than the arterial blood going to these organs, whereas blood going to and from a limb or a kidney shows no difference in its bilirubin content. It therefore seems evident that bilirubin is produced in the marrow and spleen. In dogs, the marrow appears to be of greater importance in the formation of bilirubin than the spleen as the excess of bilirubin found in venous blood from marrow was greater than that found in venous blood from the spleen. Moreover, bilirubin still appeared in the plasma after complete excision of the abdominal organs. Later, the blood leaving the liver was shown to have an excess of bilirubin over that of arterial blood entering this organ. In 1847, Virchow, observing hæmatoidin in old blood clots, concluded that bile pigment may be formed outside of the liver. However, certain Continental workers are as yet unconvinced that the polygonal cells of the liver play no part in the formation of bilirubin.

To Aschoff we owe the conception of specialized endothelial cells, mesoblastic in origin, lying along the venous sinusoids and capillaries of the bone marrow, spleen, and liver, and the lymph sinusoids of the lymphatic glands, where hæmoglobin is disintegrated and pigment is formed. In 1913, McNee

suggested that bilirubin has its origin in these endothelial cells. Rich and others have demonstrated the conversion of hæmoglobin into bilirubin by wandering endothelial cells in the periphery of old blood clots. Rich demonstrated also the formation of bilirubin from hæmoglobin in tissue cultures. In the liver, the reticulo-endothelial system is represented by the Kupffer cells. In birds, in which the spleen is small and the liver is large, the Kupffer cells are prominent and play an important part in the conversion of hæmoglobin into bilirubin. In mammals, they play only a small part in this conversion, but after splenectomy their number and function are increased.

Bilirubin formed in the reticulo-endothelial system is carried to the liver by the portal vein. In each lobule it is excreted from the venous sinusoid by the polygonal cells into the bile capillaries. However, if the bilirubin content of the incoming blood is too high or if the liver cells are damaged, or if both conditions prevail the excretion of bilirubin is inadequate. The unexcreted portion then banks up in the portal blood and passes into the general circulation by way of the hepatic vein, causing "retention jaundice." If the bilirubin is duly excreted, but its passage into the intestine is blocked, there is a regurgitation from the overfilled canaliculi into the tissue spaces and thence into the periportal lymphatics, the venous sinusoids, and the central interlobular vein, with resulting "regurgitation jaundice."

The two forms of hyperbilirubinæmia may co-exist. Jaundice is a visible sign of excess of bilirubin in the blood. Spectrophotometry is the more delicate, and the van den Bergh test the more easily applied, method for the detection and measurement of hyperbilirubinæmia. The direct or immediate van den Bergh reaction is due to bilirubin that has been excreted by the liver cells (regurgitation jaundice), and the indirect or delayed reaction represents bile pigment retained in the circulation (retention jaundice). A diphasic reaction indicates that bilirubin is present in excess, but does not reveal the mode of its entry into the blood. In health, the bilirubin of the blood varies between 0.2 and 0.5 units (0.1 to 0.25 mgm. per 100 c.cm.). The icterus index gives only quantitative figures and does not differentiate small amounts of bile pigment and other coloring substances such as those found in carotinæmia.

Retention jaundice, if hæmolytic, is never deep. It may occasionally disappear though the disease persists. Chilling of the body will increase it. Though commonly manifested in infancy, its first appearance may be delayed for several years. In some members of the patient's family there may be increased fragility of the erythrocytes, splenomegaly, and anemia but no jaundice, whereas in others jaundice may be the outstanding feature. In hæmolytic icterus an increased quantity of bilirubin passes from the bile ducts into the intestine. The urobilinuria which is so usual in hæmolytic icterus is accounted for by the increased amount of urobilin in the bowel.

With increased production of bilirubin from the blood in hæmolytic icterus the liver becomes surcharged with this product and biliary colic or dyspepsia and regurgitation jaundice are likely to occur. Of forty cases of hæmolytic icterus, symptoms due to the gall bladder or biliary ducts occurred in thirteen.

As a rule the spleen is palpable and often considerably enlarged. If it is not palpable it may be enlarged upward and backward. The degree of enlargement of the spleen is not necessarily related to the severity of the disease. The dominant part played by the spleen is demonstrated by the complete disappearance of jaundice and anæmia following splenectomy.

The degree of anæmia is dependent upon the blood destruction and formation. The gravity of the condition depends upon the amount of marrow required to maintain the erythrocyte level as well as the number of red blood cells. Symptoms may be absent when the erythrocyte count is low. Microcytosis is present and the reticulocytes are increased.

In contrast to pernicious anæmia, the red blood cells are more fragile than normal. In normal blood the fragility varies from 0.45 to 0.35, whereas in hæmolytic jaundice it may be as high as 0.8. However, increased fragility is not an essential feature of the latter condition. Splenectomy may or may not change the fragility of the erythrocytes. An interesting association between the microcytosis and the increased fragility is brought out by the observation of Krumbhaar that mammals with the smaller red blood cells have the higher fragility.

This report is based on forty cases. Frequently several members of the same family suffering from the disease were studied. In one family there were nine cases of hæmolytic jaundice in four generations. In several of the cases reviewed the patient did not come under observation until late in life. In about 40 per cent of the complicated and fatal cases the presence of disease of the biliary tract was known. Of the twelve deaths, only one followed splenectomy. Eight were due to hæmolytic anæmia, two to cholangitis, and two to intercurrent disease.

The results of splenectomy are strikingly good. In fourteen cases in which this operation was done there was only one death. Even when the anæmia is severe, recovery is rapid and permanent. Although there is no reason why splenectomy should not be performed on older patients, children over ten years of age stand the operation best.

If both the spleen and gall bladder must be removed it is best to remove the spleen first and delay the removal of the gall bladder until after recovery from the splenectomy. A transverse incision will save time.

Preliminary blood transfusion should receive careful consideration. Certainly a "pilot" dose should precede transfusion. After careful typing, severe jaundice followed transfusion in two cases and aggravated the patient's already serious condition.

Sometimes following splenectomy there is a polycythæmia, sometimes a failure of cure. Because of

the occasional polycythæmia, Weinert has advocated more conservative surgery such as ligation of the splenic vessels. The author does not approve of this procedure.

In cases coming to autopsy the spleen is enlarged and shows a dark red pulp. On microscopic examination, the malpighian bodies are found to be small. The most noticeable change is in the pulp, which is engorged with red blood cells. The red cells are considerably more numerous than the nucleated cells, whereas in normal spleen pulp the red blood cells and nucleated cells are about equal in number. Much hæmofuscin and a little hæmosiderin are present. Gandy-Gamna nodules are found.

The liver is enlarged and its microscopic appearance closely resembles that seen in pernicious anæmia.

The marrow is very rich and cellular and is mottled with dark red. It contains no fat. It is hæmoblastic more than leucoblastic. Normoblasts are more numerous than megaloblasts. Mitotic figures show a varying prominence. There is a tendency toward the formation of extramedullary marrow.

According to these findings there is a struggle to form new blood in the marrow as severe blood destruction occurs. In hæmolytic jaundice the increased erythrocyte destruction is met, and for a time successfully, by increased red cell formation. As the capacity for red cell formation declines, the blood picture approaches that of pernicious anæmia.

The more closely hæmolytic jaundice is studied the more the doubt grows as to whether, in the strict sense, an acquired form exists. Manifestations in early life may be so slight as to pass unnoticed or to be forgotten.

EARL O. LATIMER, M.D.

Stewart, W. H., and Illick, H. E.: Five Years' Experience with Oral Cholecystography. *Am. J. Roentgenol.*, 1931, xxv, 602.

After five years' experience, the authors conclude that the oral administration of the dye for cholecystography is more satisfactory and reliable than the intravenous administration.

Absence of a shadow or the appearance of only a faint shadow in the roentgenogram is often due to faulty technique. Therefore numerous roentgenograms should always be made for comparative study. In the authors' cases tetra-iodophenolphthalein is given in sarsaparilla. The dose is regulated according to the body weight. During the fasting period all food is withheld and an enema is given routinely. Before the roentgenograms are made the patient is questioned with regard to the occurrence of diarrhoea and vomiting. Gas in the stomach or duodenum is removed by having the patient swallow a few sips of water or take a few deep breaths. Gas in the bowel is removed by enemas. During the exposure the patient is instructed to stop breathing completely in order that the outlines of the liver edge, kidney, and spine in the roentgenogram may be sharp.

Frequently when no gall-bladder shadow is obtained in the first film, excellent shadows are seen in subsequent films. When the shadow is faint in numerous films made in two separate examinations, the authors often venture a diagnosis of disease. Faint shadows are most frequently caused by slight jaundice, extrinsic obstructions of the cystic duct, duodenal ulcer, fever, obesity, pregnancy, cancer of the stomach, vomiting, diarrhoea, hepatic disease, severe pancreatic disease, advanced renal lesions, and faulty technique. Nothing aids more in correcting the interpretation of faint shadows than repeating the test. Recently the authors have been making more extensive studies of cases after the emptying meal. Shadows of cholesterol stones are best demonstrated when the gall bladder is half contracted, and nephrolithiasis and cholelithiasis are best differentiated during evacuation. Moreover, when the shadow of a contracted gall-bladder is obtained, the presence of gall stones can be ruled out positively.

Of thirty cases showing no shadow, the X-ray diagnosis was confirmed at operation in all but one, and of twenty cases with faint shadows it was confirmed in all. In these cases the greater frequency of pathological changes in the outer layers of the gall-bladder wall than in the mucous membrane indicated that there was more interference with contractility than with concentration.

STANLEY H. MENTZER, M.D.

Waters, C. A., and Firor, W. B.: Further Studies in the Application of Intravenous Cholecystography and Liver-Function Determination as Employed in Office Practice. *Am. J. Roentgenol.*, 1931, xxv, 590.

The authors advocate the intravenous method of cholecystography which they have found entirely satisfactory during the two years they have employed it.

There are three complications which may attend the use of this method. The most common and least serious is urticaria. This can be controlled by the hypodermic administration of adrenalin. Another is endophlebitis obliterans, an inflammation of the intima of the vein resulting in obliteration of the lumen of the vessel and caused by the alkalinity of the dye. The third is cellulitis produced by faulty technique in the injection.

The authors use the dye from sterile ampoules which has been dissolved in 100 c.cm. of freshly distilled water, filtered, and boiled on a water bath for twenty minutes. They inject the dye solution and normal salt solution by gravity from separate burettes, maintaining a 3:1 ratio of salt to dye. After the injection, they introduce 50 c.cm. of normal salt solution to cleanse the vein.

The chief disadvantages of the oral method of administering the dye are repeated non-fillings and faint visualization, which may occur in examinations of normal subjects as well as examinations of persons with disease of the biliary tract. They are due to changes produced in the dye before its absorp-

tion by the acidity of the stomach and the reaction of the small intestine and to incomplete absorption of the dye by the gastric and intestinal mucosa. The intravenous method is free from such disadvantages according to the authors' experience, the intravenous method is quick and simple, it does not cause dangerous reactions, and it produces more dependable cholecystograms than the oral method. In 25 per cent of cases in which the biliary tract was found normal by the oral method it was found abnormal by the intravenous technique, and in 25 per cent of cases in which the findings of the oral method were doubtful the biliary tract was found normal with the intravenous technique.

The authors outline the method by which the dye is employed for liver-function tests with the Young-Elvers universal colorimeter, but conclude that the value of this procedure is questionable at the present time except in cases with a high retention in which operative intervention is contra-indicated.

STANLEY H. MENTZER, M.D.

Balice, G.: Regeneration of the Gall Bladder (*La rigenerazione della cistifellea*). *Poliedin.*, Rome, 1931, xxviii, sez. chir. 213.

Balice reports experiments on dogs which showed that the gall bladder regenerates completely even when the greater part of the cystic duct is removed with it. Because of this regeneration and the fact that calculosis is not merely a local disease of the gall bladder, cholecystectomy is not indicated in calculous cholecystitis. Stones do not form in the gall bladder alone, but are found there more frequently than in other parts of the biliary tract because the anatomical nature of the gall bladder favors their accumulation.

The operation of choice in calculous cholecystitis is ideal cholecystotomy or cystostomy followed by drainage even in cases in which the gall bladder is apparently normal. Cholecystotomy has a much lower mortality than cholecystectomy and is no more apt than the latter operation to be followed by recurrence.

AUDREY GOSS MORGAN, M.D.

Graham, H. F.: The Value of Early Operation for Acute Cholecystitis. *Ann. Surg.*, 1931, xciii, 1152.

The author compared the results obtained in 20 cases of acute cholecystitis which were operated upon within twenty-four hours after the onset of the acute symptoms and 178 cases in which operation was delayed until the acute symptoms had subsided. In the latter group the mortality was higher, the operations were more difficult, and postoperative complications were more frequent and severe than in the former group. Graham therefore concludes that operation should be performed early whenever possible.

STANLEY H. MENTZER, M.D.

Mackey, W. A.: Cholelithiasis: Some Pathological Observations. *Glasgow M. J.*, 1931, cxv, 225.

Seventy-five gall bladders removed surgically were studied both pathologically and bacteriologi-

cally in an attempt to trace the process of stone formation. The bacteria found most frequently were non-hæmolytic streptococci and coliform bacilli, but in about half of the definitely pathological gall bladders no organisms could be discovered. Cholecystitis pursues a course of exacerbations and remissions, and it was noted that bacteria were usually absent during the later period.

The author believes that cholesterol stones are due to metabolic disturbances rather than infection, and that the presence of stones predisposes to attacks of acute cholecystitis.

WILLIAM E. SHACKLETON, M.D.

Gioja, E.: Carcinoma of the Gall Bladder (Sul carcinoma della cistifella). *Arch. ital. di chir.*, 1931, xxviii, 603.

After reviewing the incidence of carcinoma of the gall bladder in various clinics, Gioja reports eight cases of gall-bladder carcinoma. One of the cases, which is of special pathological importance, is reported in great detail. The patient, a woman fifty-one years of age, had had typhoid fever at the age of six. She complained of recurrent attacks of pain radiating from the right upper quadrant of the abdomen to the right scapula, severe nausea, and vomiting. These symptoms had been present for five months prior to her admission to the clinic. Careful clinical and roentgenological examination led to a diagnosis of cholecystitis, probably with stones. Cholecystectomy was performed. The patient recovered and was well when she was last seen, one year after the operation.

Examination of the excised gall bladder showed that it was somewhat enlarged and that its walls were thickened. The lumen, which contained a brownish liquid with fragments of necrotic tissue, was partially filled by a soft tumor mass attached to the fundus. There were no stones. The mucosa was trabeculated and resembled the mucosa of the chronically obstructed urinary bladder. The muscle layer was thickened. The hyperplasia of the musculature was attributed to the attempt of the gall bladder to expel small pieces of necrotic tissue which became separated from the tumor and impacted in the cystic duct. The colics were due to the intermittent cystic duct obstruction.

Microscopic examination showed hyperplasia of the mucosa near the neck of the gall bladder. In the vicinity of the attachment of the tumor there was a proliferation of the mucosa in the form of tubules and cavities which suggested an adenoma. The neoplasm was an adenocarcinoma. The transition between the adenoma and carcinoma was abrupt.

The author cites cases of adenoma with carcinoma of the gall bladder that he was able to find reported in the literature and reviews various theories as to the relationship of the two neoplasms. Histopathological studies of human gall bladders containing stones or presenting chronic inflammatory changes and of similar conditions produced experi-

mentally in guinea pigs have shown that the mucosa of the gall bladder can be stimulated to give rise, even in portions of the organ that do not normally contain glands (such as the fundus), to true adenoma and, according to some investigators, to adenocarcinoma.

Gioja believes that in his own cases the carcinomatous tumor was primary and led to chronic irritation and hyperplasia of the adjoining mucosa with subsequent proliferation of the adenomatous tissue.

PETER A. ROSE, M.D.

Mahorner, H. R., and Mattson, H.: The Etiology and Pathology of Cysts of the Pancreas. *Arch. Surg.*, 1931, xxi, 1018.

Faulty development of an acinus or a duct may play a part on the formation of cysts of the pancreas. Cysts due to such a cause are found rarely in infants. Trauma at birth may also be a factor. Cysts of the pancreas, like those of the liver, are sometimes associated with polycystic disease of the kidneys. In the pancreas, dermoid cysts are rare. The remote possibility that inclusion cysts may be present in the pancreas should be borne in mind.

Of the forty-seven cases of cyst of the pancreas in which surgical procedures have been carried out at the Mayo Clinic since Judd's report in 1921, there was a history of trauma preceding the onset of the symptoms in eight (17 per cent). In many cases of cyst of the pancreas following trauma symptoms do not develop for weeks or months. In some, however, they appear at once. Occasionally the history suggests that indirect trauma may produce pancreatic cysts. It is possible that the rupture of a vessel during the strain of parturition may be a cause of such cysts. Russ supposed that in the case which he reported the cyst was due to a hæmorrhagic lesion occurring in the course of puerperal sepsis. This suggests that cysts of the pancreas may be produced by sterile or infected emboli causing necrotic areas which are subjected to the action of the escaped pancreatic ferments, with consequent sepsis and hæmorrhage.

The part played by obstruction to the outflow of pancreatic secretion in the production of pancreatic cysts is not definitely known. Irregular dilatation of the duct distal to an area of stenosis produced by a carcinoma of the head of the pancreas has been observed. Ligation of the pancreatic duct does not result in the formation of cysts. Little, if any, dilatation occurs distal to the point of ligation. As partial rather than complete obstruction is the theoretical cause of hydronephrosis and dilatation of the biliary passages, the authors suggest that partial obstruction may produce a similar result in the pancreas.

More interesting than the mere passive rôle of obstruction is the possibility that gall stones in the end of the common bile duct may shunt bile into the pancreatic duct. The softening caused by an infarct or the reaction to an infected embolus may contribute to the production of a cyst. Cysts which

owe their origin to hæmorrhage into the tissue (apoplectic cysts) and to softening are pseudocysts and are not lined with epithelium.

Tünger advanced the theory that retention and obstruction to the outflow of secretion is brought about by the fibrosis following chronic interstitial pancreatitis.

The term "proliferating cyst" is encountered frequently in the literature. Mahorner and Mattson classify cysts of this type with neoplasms. Neoplasms of the pancreas produce cysts as the result of: (1) an inherent tendency to form a cyst lined with epithelium, or (2) degeneration and liquefaction in such neoplasms. Carcinoma of the pancreas, although relatively common, does not tend to cause the development of cysts. However, microscopic cysts lined with epithelium have been observed in such a tumor.

Multilocular cysts are not necessarily cystadenomata. Even in benign cysts there may be papillary ingrowths or cysts in the wall. Only two cases of cystadenoma of the pancreas were found among eighty-eight cases of cyst of the pancreas in which operation was performed at the Mayo Clinic and in twenty cases studied at autopsy. In one of the cases a cyst had been drained in January, 1921. The pathologist reported cystadenoma.

Malignant cysts of the pancreas are likewise rare. Among the eighty-eight patients with pancreatic cysts treated surgically at the Mayo Clinic there were four with carcinomatous cysts.

Kerr reported a cyst, the wall of which he said was teratomatous. He did not give a detailed description of its histopathological features.

Cysts of the pancreas caused by parasites are rare. They are encysted forms of some of the parasites for which man is the intermediate host. Only two types described, *echinococcus* cyst and *cysticercus cellulose*, have been noted by the authors.

Capper, A.: The Nature of von Jaksch's Anæmia and the Effect of Splenectomy. *Am. J. M. Sc.*, 1931, clxxi, 620.

The author reports two cases of von Jaksch's anæmia which were benefited by splenectomy.

The first case was that of an Italian boy of four years who had had a severe attack of jaundice and malaria at the age of nine months and when two and a half years old lost weight, became unable to stand, sit, or talk, and showed evidences of mental disturbances. There was no jaundice. The liver was moderately enlarged and the spleen could be felt below the umbilicus. The hæmoglobin was below 10 per cent, and the red cell count was 1,700,000. There was no clot retraction at the end of forty-eight hours. During eleven months in the hospital the patient had twenty-three transfusions. These raised the hæmoglobin to 35 per cent and the red cell count to 2,400,000. Splenectomy was done because the transfusions resulted in only temporary improvement. The spleen weighed three times as much as the spleen of a normal child of the same age. After

the splenectomy, transfusions were required only once a month, whereas before the operation they were necessary two or three times a month.

The second case was that of an Italian girl three years old who was born in the United States and at the age of seven months had an attack of vomiting, diarrhœa, and fever which lasted for nine weeks. The spleen was palpable 5 cm. below the costal margin. An acute otitis media was present. Drainage of the otitis media and two transfusions were followed by considerable improvement. A year later the intestinal disturbances recurred and the child became emaciated and unable to stand or walk. The liver and spleen were both enlarged, the hæmoglobin was 22 per cent, and the red cell count was 1,900,000. During a period of six months eight transfusions were given. These doubled the hæmoglobin and the red cell count. Splenectomy was then performed. While there has been no material change in the hæmoglobin and red cell count, only two transfusions have been necessary during the two months that have elapsed since the operation.

STANLEY H. MENTZER, M.D.

Godard, H., and Palios, C.: Splenectomy (La splénectomie). *Rev. de chir.*, Par., 1931, 1, 63.

In experiments on guinea pigs, the authors found that splenectomy caused a decrease in the number of red cells rather than an increase such as would occur if the function of the spleen were purely hæmolytic. The decrease was followed by an increase, but the increase showed oscillations for quite a long time after the operation.

In another series of experiments the pedicle of the spleen was ligated and the parenchyma sacrificed in order to isolate the spleen from the circulation and allow the splenic fluid to be absorbed by the peritoneal cavity. This procedure made it possible to suppress the hæmolytic function of the spleen and study the physiological action of the fluid that exudes from it. The experiments caused no decrease in the number of red blood cells. In the authors' opinion this indicates that the spleen furnishes some substance that tends to preserve humoral equilibrium.

Hyperplasia of the bone marrow occurs after splenectomy as well as after the injection of a number of protein and colloid substances. Any disturbance of the colloid composition of the blood seems to cause hyperplasia of the bone marrow. This is further indirect proof of the influence of the spleen on humoral equilibrium, since removal of the spleen must cause hyperplasia of the bone marrow either by suppressing a substance necessary to normal function of the marrow, which is not very probable, or by changing the colloidal constitution of the blood.

From a practical surgical point of view the authors conclude that the spleen has a secretion the suppression of which causes general disturbances and postoperative anæmia. Splenectomy is therefore a serious operation. The humoral action of the spleen is probably dependent upon the splenic

reticulo-endothelial system. This would explain both the intensity of the symptoms and the readiness with which compensation is brought about.

AUDREY GOSS MORGAN, M.D.

MISCELLANEOUS

Overholt, R. H.: Intraperitoneal Pressure. *Arch. Surg.*, 1931, xvii, 691.

The abdomen may be considered a closed box with partially rigid and partially flexible walls. The specific gravity of the abdominal contents and the degree of flexibility of the walls determine the pressure at any given point. When the abdominal contents sink to the dependent portion of the cavity the pressure in the lower part of the cavity is increased and the pressure in the upper portion is decreased.

A large amount of experimental work has been done to demonstrate the pressure conditions in the abdominal cavity. Overholt discusses many of the factors to be considered in measuring the intraperitoneal pressure and points out the sources of error in experimental work on this problem. He cites particularly the error of taking pressure readings at only one point in the abdomen and of using an open U-tube water manometer.

In experiments on dogs, Overholt introduced into the abdominal cavity a curved fenestrated cannula connected with a closed water-bubble manometer devised by Lewis. Changes in air volume from temperature variations were prevented by a water bath constructed about the manometer. Photographic records of the movement of the bubble of water were made by projecting a beam of light

through the microscope and focusing it on a moving film carried in the recording part of an electrocardiograph. With the dog on its back in the horizontal position and with the cannula in the epigastrium, readings were made on thirty-three dogs. In the cases of thirty-two, a mean subatmospheric pressure (between inspiration and expiration) was recorded. In seventeen dogs which were breathing quietly it was found that the pressure in the peritoneal cavity decreased during inspiration and increased during expiration. With the cannula in the lower part of the abdomen and the animal placed in the horizontal position, the mean pressure in the majority of instances was above atmospheric pressure. With the animal in the vertical, head-up position, a marked fall in the intraperitoneal pressure in the upper part of the abdomen and an increase of the pressure in the lower part of the abdomen were recorded. Pressure on the abdominal wall with binders, inflation of the stomach, and similar procedures increased the pressure in the epigastrium barely sufficiently to raise it above the atmospheric level. The injection of air into the peritoneal cavity immediately increased the intraperitoneal pressure. The injection of 100 c.cm. of air caused an immediate and marked rise, and subsequent injections of air caused a slight but not proportional increase.

Overholt concludes that the intraperitoneal pressure is exceedingly variable. It is greatest in the most dependent portions and lowest in the uppermost portions. The fact that the pressure within the peritoneal cavity decreases simultaneously with the decrease in intrapleural pressure suggests a close relationship between abdominal activity and respiration.

ALTON OCHSNER, M.D.

GYNECOLOGY

UTERUS

Lebon and Laffont: A Case of Cardiac Uterus (Uncas d'utérus cardiaque). *Bull. Soc. d'obst. et de gynec. de Par.*, 1931, xx, 233.

The case reported was that of a woman who sought treatment for dyspeptic disturbances and bleeding from the uterus. The patient was pale and had lost 10 kgm. in eighteen months. Examination of the heart revealed signs of mitral stenosis. On vaginal palpation, the uterus was found slightly enlarged. The cervix was normal.

As uterine asystole was suspected, the patient was bled, a purgative was given, and 20 drops of crystallized digitalin were administered daily for three days. When the patient was seen again five days later the hemorrhages had stopped, the cardiac rhythm was slowed from 118 to 90, and the rare extrasystoles formerly perceived had completely ceased. However, the signs of mitral stenosis were clearer than at the first examination and to the diastolic thrill and the doubling of the second period a very clearly perceptible presystolic murmur was added.

The patient was put on a fruit, vegetable, and milk diet containing very little salt, and was ordered to take every month a ten-day digitalin cure, during which she was to remain on a salt-free diet. When she was seen later she reported that she had had no further bleeding except when she was under considerable strain during the illness of a parent. The hemorrhages then occurring quickly yielded to the combined action of rest, a milk diet, and a cardiac tonic. The color of her skin had improved. The number of red cells had increased from 2,500,000 to 4,800,000. The dyspeptic disturbances had ceased and the lost weight had been regained.

As in cases of uterine asystole reported by others, there were no other signs of cardiac insufficiency. As in Lemierre's case, examination disclosed no edema of the lower limbs, no hepatomegaly, and no râles at the bases of the lungs. The absence of the usual signs of cardiac insufficiency may be explained by the salutary effect of the uterine hemorrhages on the stasis of the inferior caval system. It is probable that the bleeding relieves congestion and prevents or retards cardiac yielding.

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Douay and Antonopoulos: Urinary Complications Following the Wertheim Operation. Extensive Gangrene of the Bladder Wall (Complications urinaires après l'opération de Wertheim. Gangrène étendue de la paroi vésicale). *Gynec. et obst.*, 1931, xxiii, 196.

For the past five years Faure has employed the Mikulicz abdominal drain following radical hysterectomy for uterine cancer. This practice has lowered

the primary mortality rate of 10 to 12 per cent to 5 or 6 per cent. However, urinary complications continue to be a grave source of danger.

Postoperative urinary retention due to defective contractility of the bladder wall caused by injury of the bladder innervation may result in cystitis which retards healing. Removal of the residual urine by catheterization will help to prevent cystitis. Urinary fistulae present more serious difficulties. The ureter may be injured at the time of dissection because of its tortuosity when traction is applied to the uterus, or it may be compressed in the ligatures surrounding the vesicovaginal vessels. Necrosis of the ureter may result from ischemia produced by cutting the nerves and blood vessels. This may be prevented by careful dissection leaving the external border of the ureter undisturbed. Vesical fistulae may result directly from perforation of the bladder or secondarily from compression of diverticula in ligatures surrounding the vesicovaginal vessels.

Bladder necrosis resulting from ischemia produced by cutting the nerve and blood supply of the bladder may become very extensive. The authors report in detail two cases of this condition. In the first case the necrosis occurred on the lateral wall of the bladder near the point of convergence of the ureters and was recognized on the twentieth day after the operation when a piece of macerated tissue measuring 15 by 20 cm. and identified on microscopic examination as being derived from the bladder wall was expelled through the abdominal incision. The anterior wall of the bladder and the trigone were unaffected. An abdominal drain was inserted. A vesicovaginal fistula developed and continued to drain for ten weeks after the operation. At the end of that time it was closed surgically. The abdominal incision then closed gradually. Two months later the patient began to urinate normally and examination showed the formation of a new bladder with a capacity of 50 c.cm. Four and one-half months later the bladder capacity had doubled.

In the second case reported there was extensive necrosis involving the median wall. Prolonged convalescence complicated by abdominal and vaginal fistulae resulted in the formation of a new bladder with a capacity of 60 c.cm.

It was thought that the necrosis in these cases might have been due to ligation of the hypogastric arteries which was done to prevent hemorrhage during the course of the operation. While Hisgen has reported a similar case in which the hypogastric arteries were not ligated, the authors consider it advisable to abandon this procedure because of the danger that would be associated with it in the presence of anomalies in the arterial supply of the bladder.

HAROLD C. MACK, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Spirito, F.: Experimental Research Regarding the Possibility of the Taking and Functioning of Autoplastic and Heteroplastic Transplants of Tubes (*Ricerche sperimentali sulle possibilità di attecchimento e di funzione di trapianti auto ed omoplastici di tuba*). *Arch. di ostet. e ginec.*, 1931, xxxviii, 301.

Spirito reports experiments on rabbits and rats in which a segment of the horn of the uterus was transplanted with or without the tube and ovary. In some of the experiments the transplantations were made from one side to the other of the same animal, and in others from one animal to another.

In the majority of the animals the grafts took, and in some of them the transplantation was followed by pregnancy. In no instance was a fertilized ovum implanted on the graft. In about half of the animals the tubes remained impervious at the site of the sutures. The author thinks that this will rarely occur in clinical cases if Kakuschkin's technique is used, the anterior fold of the broad ligament being sutured carefully to that of the graft and the posterior fold to the posterior fold. From his own experimental work and the clinical work of Kakuschkin, Spirito concludes that this is a promising method of treating sterility due to impermeability of the tubes.

AUDREY GOSS MORGAN, M.D.

Cotte, G.: Painful Ovulations (*Les ovulation douloureuses*). *Rev. franç. de gynéc. et d'obst.*, 1931, xxvi, 129.

Attacks of more or less acute intermenstrual pain associated occasionally with elevations of the temperature coincide in some women with the time of ovulation. These attacks occur usually from ten to twelve days after menstruation and are accompanied by pain and leucorrhœa and occasionally by uterine bleeding. While they have received considerable attention in the literature, very little of a definite nature is known regarding them, reports and opinions varying greatly. Many apparent contradictions are due to the fact that the symptoms do not always have the same cause. In a certain number of cases, rupture of the follicle has given rise to a pelvic hæmatocele. The symptoms (syncope, pallor, and pelvic pain) closely simulate those of tubal abortion or tubal rupture, but the amount of internal hæmorrhage is very small in comparison with that occurring in ectopic gestation. Massive internal hæmorrhage of ovarian origin generally results from a ruptured corpus luteum rather than from a ruptured follicle as the blood supply of the corpora lutea is more abundant than that of the follicles.

Ovulation disturbances are of two types, the uterine type and the ovarian type. Those of the uterine type are characterized by hypogastric pain, cystalgia, and anal tenesmus and usually occur in women with uterine hypoplasia. Those of the ovarian type are characterized by lumbar pain, severe pain in the right or left lower quadrant of

the abdomen, and pain radiating from the kidney region to the thigh. The monthly recurrence of these symptoms often leads to neuroses.

The pathogenesis of ovulation disturbances is little understood. Sclerosis of the albuginea leading to difficulty in rupture of the follicle, chemical peritonitis following rupture of the follicle, and vagosympathetic disturbances resulting from hormone activity have been suggested as explanations. Bouilly has noted that the symptoms are never present in women with uterine or adnexal disease. The frequent finding of ovarian enlargement at the time of the symptoms suggests to the author that their cause lies in some alteration of the ovarian parenchyma. The failure of any one mode of treatment to effect a cure in all cases substantiates his theory that the causes are multiple.

In cases in which congestive symptoms predominate, hydrastis and hamamelin have been found of value. When the symptoms are chiefly neuralgic, sedatives are helpful. Glycerin tampons, gynecological massage, and warm hydrotherapy occasionally give relief. Diathermy is of no value. In cases with abnormal mobility of the uterus associated with prolapse of the ovary, the use of a pessary is beneficial. In extreme cases of this type, suspension of the uterus may be indicated. Separation of adhesions surrounding the ovary sometimes has good results. When the adhesions are unilateral, the author advises unilateral oöphorectomy. In the cases of women who are unable to bear children because of abnormalities of the genitalia, Cotte has transplanted the ovaries into the omentum, a procedure which preserved the menstrual function. He has performed this operation in twenty cases with failure in only one. He is unable to account for the persistence of the intermenstrual pain in one case as the nervous connections of the ovary were separated before the transplantation.

HAROLD C. MACK, M.D.

Wehefritz, E., and Glerhake, E.: The Specificity of the Female Sex Hormone (*Ueber die Spezifität des weiblichen Sexualhormons*). *Zentralbl. f. Gynæk.*, 1931, p. 16.

The authors report studies carried out to determine whether each type of organism possesses its own distinct sex hormone or whether the same elementary hormonal substance is present in all organisms regardless of their biological species. A review of the results of the many hormone studies on animals which have been carried out to date shows that in a large number of animal species the female sex hormone of one species is capable of producing isosexual changes in an animal of another species. It has been proved that, among mammals, the female sex hormones are biochemically identical. Fish and birds have also been subjected to experiments. Corroborating the findings of Riddle and Zawadowsky, the authors demonstrated that the female sex hormone of mammals exerts an isosexual effect in the avian organism. Following injections of menformon

or progynon into recently incubated hens' eggs, they obtained an antagonistic inhibition of the primary and secondary sex characteristics of male chick embryos. Moreover, the chickens developed female plumage. In another series of investigations, the authors found that the hormones of the ovary of the hen are capable of producing oestrus in mice, as shown by the Allen and Doisy test.

As the result of the growing recognition of the universal existence of sex-determining substances, representatives of the lower vertebrates have also been subjected to hormone studies (Sereni, Loewe, Lange, and Kaer). Although a great deal still remains to be learned (especially with regard to the aplacentia and anura), the findings of the investigations carried out to date may be considered to support the conception of the universal non-specific character of the female sex hormone in the entire class of vertebrates. Some investigators have searched the plant kingdom for substances resembling the animal hormones in their action. Loewe, Lange, and Spohr were able to extract substances resembling the female sex hormones (thelykinine) from the blossoms of the yellow water lily and from willow catkins. It is noteworthy that thelykinine is most abundant in the female portions of the blossoms. Blotevogel, Dohrn, Faure, and Poll made studies of sugar beet seeds, potato bulbs, parsley roots, cherries, plums, and yeast cells. These investigations were similar to the studies made by the authors.

The authors selected first for their studies the almost completely mature sunflower (*Helianthus annuus*). This they separated into two parts, the germinal centers and the discoid blossoms. Eight hundred grams of seed grains and pods were ground up and extracted with alcohol and water and the extract was treated according to the separation method suggested by Butenandt. The remaining generative portion of the flower was treated in the same manner. In this way the authors succeeded in extracting substances which very definitely called forth the vaginal signs of oestrus shown by vaginal smears and caused enlargement of the uterus in white mice. On microscopic examination the ovaries of the mice showed mature follicles and corpora lutea. From the remaining generative portions of the flower an extract of only very low potency could be obtained.

If the specific organic action of the female hormonal substances of mammals is effective also in lower organisms, thelykinine must contain a specific substance which acts directly upon the female organs of animals and the regenerative systems of plants. Accordingly it appears that there exists in the organic world an elementary substance which is responsible for the characteristics of the female sex.

WEIEFRITZ (G).

King, E. S. J.: The Association of Ovarian Neoplasms with Endometrial Hyperplasia. *Australian & New Zealand J. Surg.*, 1931, 1, 28.

King reports three cases of tumor of the ovary of the stromatogenous variety associated with abnor-

malty of the endometrium. In the majority of cases of endometrial hyperplasia with ovarian involvement, lutein cysts or granulosa-cell tumors have been present, but in King's cases the tumors were apparently derived from the stroma tissue of the ovary. It is known that under normal conditions certain constituents of the ovary have a powerful influence on the endometrium. The corpus luteum is responsible for the embedding of the ovum and is essential for the formation and maintenance of the decidua. These processes fail to occur or they regress if the ovary is removed or the corpus luteum is cauterized. Recent experiments on animals have demonstrated that the graafian follicle produces a secretion which is similar to that of the corpus luteum and has a powerful effect on the endometrium and the vaginal epithelium. This substance has been found in follicular cysts and has been obtained at operation on human subjects. Investigations have shown also that the various stages in the development of the endometrium may be correlated with the various stages of the development of the follicles.

A persistent luteal cyst may be associated with, and presumably may produce, hypertrophy of the endometrium. As the amount of luteal tissue in the walls of the cyst may be quite large, it is probable that the excess secretion is responsible for the abnormality. One of the author's cases of solid stromal-cell tumors showed invasion of the muscle coat and the formation of an adenomyoma of the rectovaginal septum. In another, an endometrial neoplasm was found.

HARRY W. FINE, M.D.

Klaften, E.: Clinical and Anatomical Considerations of the Granulosa-Cell Tumors of the Ovary (Zur Klinik und Anatomie der Granulosazell-tumoren des Eierstockes). *Monatsschr. f. Geburtsh. u. Gynæk.*, 1930, lxxxvi, 392.

After a review of the literature, the author reports four cases of granulosa-cell tumor of the ovary with postclimacteric hæmorrhage.

The first case was that of a woman fifty-six years of age who had borne four children and had had three abortions. After the menopause, which occurred in her forty-ninth year, the patient began to have hæmorrhages lasting an entire month with only brief remissions. Gynecological examination revealed a tumor larger than a fist on the left side of the pelvis. At laparotomy, complete removal of the uterus and adnexa was done. Microscopic examination of the tissues removed disclosed a granulosa-cell tumor of the ovary and cystic glandular hyperplasia of the endometrium.

The second case was that of a woman fifty-six years of age who had borne two children and had had four abortions. The patient had passed the menopause in her forty-sixth year. Three months before she was seen by the author she had a sudden hæmorrhage from the vagina, and since then the bleeding had recurred intermittently. Gynecological examination revealed a tumor of the left ovary the size of an apple. Complete extirpation of the uterus and adnexa was done. The operation was followed

by irradiation because the tumor was soft and friable. The neoplasm was partially cystic and showed areas which had a moiré-like arrangement of the tumor cells and other areas suggesting cylindrical-cell carcinoma. The endometrium presented the changes of small cystic glandular hyperplasia.

The third patient was a woman fifty-four years of age who had borne nine children and for six years had had periods of alternating hæmorrhage and amenorrhœa. A tumor could be palpated to the left of the uterus. At operation, the uterus and adnexa were removed. The tumor was ruptured and numerous whitish-yellow particles (ascites) escaped. The solid portions of the tumor showed the picture of a folliculoid carcinoma. Besides adenomyosis uteri internus, there was a cystic glandular hyperplasia of the endometrium.

The fourth patient was a woman sixty-two years old who had borne ten children and had passed the menopause in her fifty-first year. She entered the hospital with a profuse vaginal hæmorrhage which had begun nine days previously and lasted fourteen days. A tumor the size of a hen's egg was found to the left of the uterus. The uterus and adnexa were extirpated by the vaginal route. On microscopic examination the neoplasm was found to be a granulosa-cell tumor. The endometrium showed cystic glandular hyperplasia.

The clinical prognosis in these cases is usually favorable. Distant metastases practically never occur. The growth of the tumor is usually slow.

In addition to the cases cited, the author reports two cases occurring in women during the child-bearing period.

The first was that of a nullipara thirty years of age. The beginning of menstruation at the age of twelve and one-half years was followed by a two-year period of amenorrhœa. Then, for a while, menstruation occurred once a year. In 1925, it occurred twice, and in 1926 only once. In 1927 and 1928 there was amenorrhœa. Uterine hæmorrhage began in May, 1929, and continued with short remissions until the patient's admission to the hospital on February 11, 1930. A tumor the size of a fetal head was found to the left of the uterus. The pubic hair showed a male type of distribution. The basal metabolism was increased 24 per cent. Laparotomy disclosed ascites. The tumor mass was found twisted about 360 degrees. It was removed with the fallopian tube. The uterus was enlarged and soft as in early pregnancy. In addition to abundant connective tissue elements, the tumor contained elements of the cylindrical and follicular type. The endometrium showed cystic glandular hyperplasia.

The second case was that of a nullipara twenty-three years old. Menstruation had been irregular for two years. Curettage was followed by temporary improvement. There was a male type of hair distribution. Palpation revealed an enlarged and cystic right ovary. Treatment with gravitol and pituitan was followed by temporary improvement. After eight months, the curettage was repeated. The

endometrium was hyperplastic. Two months later the hæmorrhage recurred. Treatment with menoform caused no improvement. About three weeks later laparotomy was performed. The uterus was enlarged and soft. The right ovary presented a tumor the size of a child's fist. The tumor was removed. During the next six months the patient menstruated regularly. Microscopic examination revealed a granulosa-cell tumor of the ovary and cystic glandular hyperplasia of the endometrium.

Following these case reports the author discusses the clinical diagnosis, the differential diagnosis, and the treatment. Of great importance is the constant finding of cystic glandular hyperplasia of the endometrium. In three of the author's cases glycogen was demonstrated in the endometrium after the menopause.

HANS O. NEUMANN (G).

Johnson, W. O., and Miller, A. J.: Primary Carcinoma of the Oviduct. *Ann. Surg.*, 1931, *xciv*, 1208.

Primary carcinoma of the oviduct is very rare; only 250 cases have been reported. Little is known as to the cause. The earliest and most constant symptom is pain in the iliac regions. In some cases a vaginal discharge may be present. Menstruation is usually disturbed. Weakness and loss of weight occur in about 25 per cent of the cases. The rarity of the condition and the absence of characteristic signs and symptoms make the diagnosis difficult.

The best form of treatment in early cases is block dissection of both oviducts and ovaries and the uterus with wide dissection of the broad ligaments and parametrial areas. If there is any chance that metastasis has occurred, thorough postoperative irradiation is indicated. A three-year cure has been obtained in only about 4.5 per cent of the cases reported.

Three types of carcinoma of the oviduct have been described; (1) a papillary type, (2) a type with epithelium arranged in imperfect gland-like structures, and (3) a type with squamous-like epithelial cells.

The authors report a case in which operation was performed.

T. FLOYD BELL, M.D.

Moulouquet, P., and Mallet, L.: The Indications for Radiotherapy in Cancers of the Ovary (Des indications de la radiothérapie dans les cancers de l'ovaire). *Bull. Soc. d'obst. et de gynec. de Par.*, 1931, *xxx*, 151.

Ovarian neoplasms differ from other neoplasms in their histogenesis, character, anatomical and clinical evolution, and radiosensitivity. This fact must be borne in mind in considering the effects of irradiation upon them. The authors report the results of irradiation in five cases of different types of ovarian malignancy.

In the first case the tumor was a germinative epithelioma (seminoma), an extremely radiosensitive neoplasm. The patient survived for four years after treatment.

In the second case an ovarian sarcoma was found. Tumors of this type are radiosensitive. The patient survived for more than two years after irradiation.

The tumor in the third case was an ovarian folliculoma. This neoplasm was radiosensitive, but grew rapidly and formed diffuse metastases. The patient survived only six months after the treatment.

The neoplasm in the fourth case was an entodermal epithelioma. This tumor was moderately radiosensitive. The patient lived eighteen months after the first treatment.

In the fifth case the neoplasm was a papillary epithelioma. This tumor was radioresistant.

Seven cases which could not be diagnosed accurately were also treated by radiotherapy. Two of the patients survived for eight years and one for nine years after the treatment.

To be effective, the treatment must be begun as early as possible and must be sufficiently extensive to cover all regions susceptible to invasion by the peritoneal or lymphatic routes. Metastases must be treated, whatever their location. It is possible to arrest the progress of even radioresistant tumors. The authors have noted no untoward effects following extensive irradiation. HAROLD C. MACE, M.D.

Béclère, A.: *Seminoma of the Ovary and Post-operative Radiotherapy of Ovarian Cancers* (Le séminome de l'ovaire et la radiothérapie postopératoire des cancers ovariens). *Bull. Soc. d'obst. et de gynec. de Par.*, 1931, xxx, 160.

Seminoma of the ovary is little understood and to date has been mentioned almost exclusively in the French literature. This neoplasm develops from a congenital anomaly (ovario-testis) and is characterized by extreme radiosensitivity. In a case reported by Hauche, a single X-ray irradiation caused the complete regression of a tumor which occupied the entire pelvis and of a recurrence which developed a year later. The patient has now remained in good health for two years.

The author cites briefly the reports of three cases of ovarian malignancy published in the German literature which, largely because of their rapid response to irradiation, he believes were cases of ovarian seminoma although they were not recognized as such. While other ovarian cancers do not respond to irradiation as well, Béclère considers the results in these conditions to be sufficiently satisfactory to warrant further trials of the treatment. He makes the following recommendations:

Exploratory laparotomy should be performed in all cases of ovarian tumor. Operable cases should be treated by radical operation. In partially operable cases an operation as complete as possible should be done. In inoperable cases, biopsy should be done and the ascites removed. In all inoperable and partially operable cases and all cases of recurrence after operation, systematic irradiation should be carried out. Postoperative irradiation is indicated in operable cases in which the process was bilateral, those in which the tumor was surrounded by adhesions,

and those in which there was a break on the surface of the neoplasm. In cases with induration in the cul-de-sac of Douglas or invasion of the cervix, radium and X-ray therapy should be combined. Béclère prefers the administration of deeply penetrating, well-filtered X-rays projected at a distance and given in fractional doses over a prolonged period to intensive treatment with strong doses given over a short period. HAROLD C. MACE, M.D.

EXTERNAL GENITALIA

Stieve, H.: *Apparently Cyclic Changes in the Vaginal Epithelium* (Ueber angebliche cyclische Veränderungen des Scheidenepithels). *Zentralbl. f. Gynaek.*, 1931, p. 194.

After critically reviewing the literature on apparently cyclic changes occurring in the vaginal mucosa, the author summarizes his own findings and conclusions as follows:

In different parts of the human body, and especially in certain parts of the lining of the oral cavities, the oesophagus, and the vagina, a stratified uncornified pavement epithelium is found. This consists usually of two not distinctly separated layers. The deeper layer is the germinal layer, in which new cells are continually being formed. In its region distinct cell fibers and interstitial cell bridges are to be observed. The inner layer lying toward the surface consists of more or less markedly flattened cells which reveal no cell fibers and interstitial cell bridges. The cells of this layer are cast off in larger or smaller numbers according to the mechanical demands made upon them. Depending upon their fluid content, they seem to be more or less swollen. When they are very markedly swollen and loosened, they are often cast off in very large numbers, especially if they are acted upon mechanically. The author found this to be the case in the oesophagus of a man who had vomited.

In the vagina, the inner layer of cells that are often markedly loosened up during the premenstrual stage are partially washed out by the blood escaping during menstruation. This accounts for the belief of many investigators that the inner layer of cells is cast off during menstruation. In many cases there is no trace of cornification. In isolated areas of the epithelium, especially in those upon which more marked mechanical demands are made at times or continuously, there appears in the region of the stratified, uncornified pavement epithelium a special layer which more or less distinctly separates the two always demonstrable layers from each other. This is formed by from one to six layers of cells, the cytoplasm of which show the most delicate granulation and the signs of beginning cornification, and the nuclei of which appear very small and contracted and show no evidence of a minute structure. The cells lying in the direction of the lumen from this layer often appear markedly swollen, being changed by the secretions of the numerous glands situated in the region of the

and radiotherapy produced an absolute cure in 15 per cent of the cases. Of the 178 women with an inoperable carcinoma, 12 who were treated by radium and X-ray irradiation were free from recurrence at the end of five years. Sixteen inoperable patients who did not receive radiotherapy and 32 who were treated only with radium died. The incidence of cure in the inoperable cases was therefore 10 per cent.

Radiotherapy was applied to operable as well as to inoperable cases. Of 50 women with operable cervical carcinomata, 12 (24 per cent) were alive at the end of five years. Sixty women were treated surgically—57 according to the Wertheim technique and 3 by vaginal operation. The primary mortality was 10 per cent, and incidence of relative cure, 35 per cent.

Nine cases of carcinoma of the fundus uteri were treated. Three were operated upon by the abdominal route and 3 by the vaginal route, and 3 were irradiated. At the end of five years, 5 of the patients were free from recurrences, 2 after each of the 2 types of surgical treatment.

Of 12 women with carcinoma of the vulva, all died. Of 9 with carcinoma of the vagina, 2 remained free from recurrence.

Thirty-three women with ovarian carcinoma were treated at the clinic. Of these, 2 are free from recurrences, 1 after surgical treatment and 1 after irradiation only. The irradiation is described fully.

With regard to the relative value of surgery and irradiation, the author says that operable carcinomata of the cervix should be treated surgically, but that in the more advanced cases the indications for surgical intervention are more limited. Carcinomata of the fundus should be treated only by surgery.

In conclusion, Reisach reports a case in which a racemose sarcoma occurring in a two-year-old child was cured with the use of radium alone. Twenty-seven and five-tenths milligrams of radium were inserted in the vagina for twenty-nine hours (600 mgm.-hr.), and the procedure repeated after an interval of three weeks. The treatment was given three years ago and the child has remained free from recurrence to date.

WILLE (G).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Rowe, A. W.: Some Functional Criteria of Normal Pregnancy. *Am. J. Obst. & Gynec.*, 1931, xli, 644.

The author studied seventy-seven cases of normal pregnancy. The average gain per week was 0.48 kgm., the average weight one week before delivery 66.3 kgm., and the average weight after delivery 57.4 kgm.

The increased urine volume during the pregnancy was definite. Broadly speaking, only the albumin and sugar content, the volume, and the urea and uric acid nitrogen percentages varied materially from the accepted norms and even in these the degree of variation differed.

The low non-protein nitrogen content of the blood so frequently recorded by others was found also in the author's cases. The urea figures showed the same general relationship. The average uric acid content of the blood was normal. It was somewhat lower before than after delivery. The creatinin content of the blood was also normal throughout the period of observation.

The blood cholesterol showed an increase above normal levels in the antepartum period, especially if allowance was made for the hydræmia, and receded to the normal after delivery. This is one blood constituent that may show a slight time influence.

The erythrocyte count revealed an antepartum decrease which was apparently due to blood dilution. The hemoglobin showed a definitely greater decrease which was absolute. The picture was that of a moderate secondary anemia with a lowered color index.

The leucocytes were somewhat increased before delivery, the increase gaining greater significance from the opposing influence of the hydræmia. The differential formula was normal, the blood showing a leucoid (adult) type. After delivery, the leucocyte count fell to more average levels, chiefly at the expense of the neutrophilic elements. This caused a relative increase in the lymphocyte group, resulting in a more lymphoid type of blood.

Deviations from the predicted normal basal metabolic rate have a very great diagnostic significance. In the cases of women who came for the test from their homes to the hospital, the values averaged 6 per cent higher than in the cases in which the machine was carried to the patient at her home.

The record of the basal metabolism is incomplete and may be seriously misleading unless it includes the pulse and respiration rates, the body temperature, and the blood pressure at the time the metabolism determinations were made. In the cases studied the lung volume showed a progressive increase during pregnancy. The tension of the alveolar carbon

dioxide was depressed to the level ordinarily associated with acidosis.

As early as the third month the majority of cases showed a galactose tolerance depressed to the terminal level. This proportion continued throughout the greater part of the antepartum period. Only at the very end was the lowest figure (20 gm.) shown uniformly. Similarly, delivery was followed by a gradual rise which was slight during the first three months, but thereafter increased steadily so that, after six months, the normal adult level was reached irrespective of the mammary status.

E. L. CORNELL, M.D.

Thoms, H.: The Diagnosis of Disproportion. *Surg., Gynec. & Obst.*, 1931, lii, 963.

The methods generally used in the diagnosis of disproportion and the value of roentgen methods employed by the author are reviewed. The article contains diagrams showing the relation of the most common abnormal types of pelvis to the normal pelvis.

In addition to the pelvic and cephalic relationship, the patient's stature and gait, physical characteristics and defects, and previous labors must be considered. External pelvimetry is of value only as an index of the condition at the superior strait. The internal conjugate is of value only when it can be palpated definitely.

Measurements of the superior strait must have a roentgenographic basis. A roentgenographic examination should be made in all cases in which disproportion is suspected. The author discusses the technique of roentgen pelvimetry and fetal cephalometry.

MAGNUS P. URNES, M.D.

Wohlwill, F., and Bock, H. E.: Further Investigations Regarding Placental Inflammations and Fetal Sepsis. A Contribution on the Recognition of Fetal "Inflammation" (Weitere Untersuchungen ueber Entzündungen der Placenta und Fetal Sepsis. Zugleich ein Beitrag zur Kenntnis der fetalen "Entzündung"). *Beitr. z. path. Anat. u. z. allg. Path.*, 1930, lxxxv, 469.

The authors report new studies of placental inflammations and fetal sepsis which were made on 565 abortion placenta and 240 fetuses. They were aided by Jacobsthal and Globig, who examined the heart blood, placenta, and organs of 160 fetuses bacteriologically.

Theoretically, inflammations may pass through the decidua from the maternal to the fetal portions of the placenta, may spread from the intervillous spaces as the result of a hematogenous infection in the mother or direct infection of the vagina, especially that due to criminal abortion, may arise from

an infected amniotic cavity and penetrate both amnion and chorion, or may result from hæmatogenous infection of the fetus. Of these possibilities, the transdecidual genesis of fetal placental inflammation has not as yet been proved, but the occurrence of vaginal infection has been demonstrated by bacteriological examinations, and cellular inflammatory reactions of the placenta are also well-known. Extensive placental inflammation is rare. The demonstration of the latter in an extensive material is the authors' special contribution.

The authors' material consisted for the most part of placenta from induced abortions. Of 565 cases of abortion, infection was demonstrated in 35.75 per cent. In 2.66 per cent, the infection was in the early stages. Cellular infiltration of the membranes without demonstrable infection was found in 3.7 per cent of the 565 cases.

The demonstration of an inflammatory reaction is of greater importance than the bacteriological findings since at least some of the latter may be explained by factors external to the maternal organism. Phlegmons of the placental portions of the membranes may be recognized macroscopically from the greenish-yellow of the deeper layers shining through the amnion. Inflammation restricted to the amnion is considered to be in an early stage. The cleft between the amnion and chorion is a favorable factor as the infectious process is temporarily impeded at this point so that maternal infection is delayed although toxæmia must still be reckoned with. Even in the absence of bacteriological evidence, transmembranous infection must be included with that of the placenta as long as the histological picture remains the same. However, bacteriologically negative tissue sections do not warrant definite conclusions since, in spite of them, bacteria may be demonstrated in cultures. In the authors' studies the mode of infection was believed to be transdecidual when the inflammatory process traveled from the basal layer of the decidua to the chorionic villi. Under such conditions the association of bacteria and granulocytes is of great importance. Sites of placental separation are especially favorable to infection.

The peculiarity of the clinical material of large cities explains why the hitherto unknown primary intervillous and transmembranous types of infection were found twice as frequently as infection of the transdecidual type. Morphologically easily recognized infections such as syphilis, tuberculosis, and leprosy, which belong to the maternal hæmatogenous infections and therefore to the primary intervillous types, are not considered by the authors. Maternal hæmatogenous infection of the fetus without changes in the membranes in pyelitis due to the colon bacillus is cited as a rare occurrence. Colon bacilli and hæmolytic streptococci were present in the heart blood of the fetus.

It is very difficult to obtain positive proof of intravital infection of a dead fetus as bacteria penetrate the body very soon after death, especially through

the lungs and stomach. This was demonstrated by experiments in which the bodies of dead infants were immersed in fluids with a varying bacterial content. In a decomposed fetal body, diffuse bacterial infiltration with a uniform distribution of the organisms is certainly a postmortem development, whereas a purely local distribution of the bacteria may represent an intravital infection. No bacterial finding is decisive without a histological examination. In the authors' study, intravital infection was considered a possibility in 7 fetuses in which bacteria were demonstrated in the heart blood and in 5 fetuses in which bacteria were demonstrated histologically and bacteriologically in the lungs and intestinal tract. The occurrence of intravital infection (which must still be considered doubtful) becomes a probability rather than a mere possibility when bacterial emboli are found in organs that can be infected practically only through the blood stream (brain, placenta, bone marrow), provided, of course, that the tissues surrounding the vessels containing the emboli are free from bacteria. Of the 12 cases of this type studied by the authors, all but 1 showed placental changes and 3 showed bacterial emboli.

Intravital infection may also be agonal. A diagnosis of fetal sepsis can be made definitely only when a cellular reaction can be demonstrated histologically. The authors made a diagnosis of this type of fetal metastatic placentitis in 11 cases. They report in detail a case of fetal sepsis due to the bacillus coli in which abortion occurred in the fifth month of pregnancy. This case was characterized by fever, splenic enlargement, the presence of bacteria in all organs, diffuse inflammation of the placenta with a fetal histiogenic and a maternal granulocytic reaction, and tissue defense reactions in the spleen, heart, and liver of the fetus. The patient recovered.

The authors describe in detail the cellular reaction which was present in the tissues. The stroma cells of the chorionic villi were swollen, their nuclei were dark, and the cell plasma was unevenly basophilic. The cells contained bacteria. Some of the bacteria had reached the intervillous spaces. The endothelial cells were moderately swollen, and showed no definite phagocytic activity. Only a few plasma cells were found. In the chorion, only a few of the cells were swollen. The Wharton's jelly of the umbilical cord showed only very slight changes.

In the fetal organs the cellular defense was less marked. This also is described in detail. The heart was affected relatively frequently, but the spleen showed changes in only 1 instance. The granulocytic defense reaction appears first during the sixth or the seventh month of pregnancy. Pus formation occurs only toward the end of pregnancy. In the authors' studies pus was never found in the fetal organs. Only in 1 fetus, which was 31 cm. long, was a retrorenal abscess discovered. The presence of numerous granulocytes in the chorionic villi was therefore a very striking finding. The granulocytes must be considered of maternal origin. This explains why they are found in the peripheral stroma only in the

presence of damage to the epithelium of placental villi, often only on 1 side, and not within the vessels of the chorionic villi.

The presence of granulocytes in the membranes and umbilical cord is more difficult to explain. These cells are found most frequently on the amniotic side. An increase in the hydrogen-ion concentration (Graeff, Ikeda) is certainly a factor, but the chief cause is the spread of the infection from the amniotic fluid to the amnion and chorion. The authors believe that here, in contrast to other parts, the granulocytes represent a migration from the fetal blood vessels, even though the walls of the blood vessels of the chorion are very thick.

Serious damage of the walls of the blood vessels of the umbilical cord was noted in only 1 instance. The findings of Simmonds exclude the possibility of a transmigration of maternal leucocytes into the umbilical cord and suggest as most probable an infiltration of leucocytes from the amniotic cavity into the umbilical cord which is devoid of an epithelial covering. However, the authors regard a migration of maternal granulocytes as more probable than a migration of fetal granulocytes. On the basis of a critical evaluation of the oxydase reaction, the authors reject an autochthonous origin of the inflammatory cells present in the chorionic membranes. As proof of the maternal origin of the granulocytes, they cite the absence of immature forms and the finding of only mature types, which appear in small numbers in the fetal blood. As proof that in the majority of cases fetal malformation is not due to fetal infection, they cite the absence of inflammatory processes during the early stages of fetal development. ROBERT MEYER (G).

Addessi, G.: A Contribution to the Study of Tumors of the Placenta (Contributo allo studio dei tumori della placenta). *Clin. ostet.*, 1931, xxxiii, 227.

Addessi reports the case of a multipara twenty-three years of age who, at her second parturition, was delivered of a placenta containing a tumor the size of an orange. The neoplasm protruded from the fetal side of the placenta, where it was covered by an apparently normal membrane. On the maternal side it was covered by a thin layer of placental tissue. It seemed to arise from the basal lamina of the chorion. Microscopic examination showed it to be a fibrochorioma.

The author was able to find only five similar tumors reported in the literature.

PETER A. ROSI, M.D.

Duca, A., and Geyer, M.: The Weight of the Fetus and Its Adnexa and Their Reciprocal Relation in Syphilis (Peso del feto e dei suoi annessi e loro rapporto reciproco nella sifilide). *Clin. ostet.*, 1931, xxxiii, 201.

In a review of the records of 3,725 obstetrical cases admitted to the Maternity Hospital of Trieste, the authors found that the syphilitic fetus weighs less than the normal fetus of a corresponding age,

but that the ratio of the weight of the syphilitic fetus to the weight of the placenta is not appreciably altered except in the cases of infants born in the sixth or seventh month. In the latter, the fetus weighs less and the placenta more than normal.

PETER A. ROSI, M.D.

Misrachi: A Contribution to the Treatment of Pyelonephritis of Pregnancy (Contribution au traitement des pyélonéphrites gravidiques). *J. d'urolog. méd. et chir.*, 1931, xxxi, 217.

The author states that while conservative treatment of pyelonephritis in pregnancy usually offers a favorable prognosis for the pregnancy, it often results in irreparable damage to the kidneys.

Pyelonephritis during pregnancy is very variable as regards both its clinical manifestations and its prognosis. Mild pyelitis is often overlooked entirely or treated as so-called "albuminuria of pregnancy." The differential diagnosis can be made only by careful examination of the centrifugized urine. The mild and for the most part asymptomatic and afebrile types should be treated medically (urinary antiseptics) to inhibit the progress of the disease rather than in the hope of effecting a cure. The more severe febrile types usually receive due attention from the obstetrician as quite frequently they must be differentiated from such conditions as puerperal sepsis, cholecystitis, and appendicitis.

Ureteral catheterization may be done without danger to the patient or the pregnancy and results almost always in relief of the symptoms and regression of the fever. The author advises against lavage of the renal pelvis, but is of the opinion that prolonged drainage with instillations of 2 or 3 c.cm. of silver nitrate over a period of several days is of value not only for relief of the symptoms, but also for the prevention of recurrences. Silver nitrate is said to aid drainage and to stimulate contractions of the renal pelvis. The fact that a spectacular cure is obtained in some cases whereas no improvement or only temporary improvement is obtained in others may be explained by differences in the degree of urinary retention and paralysis of the renal pelvis. Drainage of the renal pelvis must be prolonged to be effective. Cystoscopy and ureteral catheterization require special care during pregnancy, but as a rule present no great difficulties. The author cautions against the use of sera, bacteriophage, and vaccines, citing instances in which they caused alarming symptoms.

Serious pyelonephritis is of two types: (1) that associated with septicemia, and (2) that which has become severe because of insufficient treatment. These types are associated with parenchymal damage, pyonephrosis, perinephritis, ureteritis, and ureteral stenosis. Active treatment is indicated. In all cases in which drainage by ureteral catheterization is impossible, nephrostomy is the operation of choice. The author reports six cases treated by nephrostomy. The one death occurred in a case of pyelonephritis following scarlet fever.

Misrachi advises against interruption of pregnancy as a therapeutic measure, believing that the shock of this procedure is harmful. In five of a series of eight cases which he cites the most severe complications followed delivery.

In conclusion, the author states that the prognosis of urinary infections during pregnancy will be improved only when obstetricians recognize the insidious and variable nature of these infections and institute active treatment early in the course of the disease.

HAROLD C. MACK, M.D.

LABOR AND ITS COMPLICATIONS

Phillips, M. H.: Obstetrical Shock. *Brit. M. J.*, 1931, i, 833.

The author states that early or primary shock is due to afferent impulses causing reflex vasodilatation and consequent marked fall of the blood pressure. In obstetrical cases an additional factor is the more or less sudden lowering of the intra-abdominal blood pressure which follows the emptying of the uterus. Delayed or secondary shock may set in after a latent period during which nothing obviously abnormal may be noted unless a routine blood-pressure reading is taken. Traumatic shock is caused by some poisonous substance which is liberated from the damaged tissues and causes widespread relaxation of the capillaries. The poisonous substance is either histamine or something closely allied to it and resembling it in action. The unexpected secondary phase of obstetrical shock may be due to extensive lacerations of the large muscles of the pelvic floor.

The author describes the signs of shock and then discusses the various causes of the condition, especially hæmorrhage and anaesthesia.

The treatment of shock consists in the prevention of further loss of blood, the restoration of body heat, and the injection of morphine for the relief of pain, anxiety, and restlessness. In the primary condition, raising the foot of the bed will almost certainly improve the blood supply to the brain. Every precaution must be taken to prevent the development of secondary shock. Treatment to this end consists essentially of measures to raise the blood pressure.

The only safe anaesthetic is nitrous oxide and oxygen. Chloroform and ether are contra-indicated. There is no urgent necessity to suture a perineal wound immediately. Of most importance are measures to increase the volume of the blood plasma.

Bodily fatigue from prolonged muscular exertion during the labor should be prevented by the induction of sleep and shortening of the second stage by proper interference. The stress of labor is exerted much more on the nervous system than on the muscular system. Relief of the pain and mental strain is best obtained by the use of scopolamine without morphine.

Records of the blood pressure during and after labor which have been kept for about two years show that the fall in the blood pressure was less when scopolamine was used.

Cold from exposure must be prevented. The woman suffering from toxæmia of pregnancy, especially toxæmia of the nephritic type, is very susceptible to the influences which favor shock.

Emotion is not often predominant, but may be a factor in serious obstetrical shock. It is best prevented by antenatal care which helps the woman to approach confinement without apprehension.

ROLAND S. CROX, M.D.

Vaudescal: Spinal Anæsthesia in Obstetrics (La rachianesthésie en obstétrique). *Bull. et mém. Soc. d. chirurgiens de Par.*, 1931, xxvi, 140.

The advantages of spinal anaesthesia in obstetrics are summarized as follows:

1. The patient is rendered free from pain.
 2. The relaxation of the perineal and abdominal muscles facilitates any intervention that may be necessary.
 3. The uterine contractions continue during the period of anaesthesia.
 4. The retractability of the uterine musculature after delivery remains unimpaired.
 5. The danger of postpartum hæmorrhage is reduced.
 6. The paralysis of the musculature of the uterine cervix permits rapid and easy manual dilatation when the latter is necessary.
 7. After caesarean section there is less bleeding and shock.
 8. Uterine involution after caesarean section is normal.
 9. A smooth convalescence is favored by the early evacuation of gas from the intestine.
- Spinal anaesthesia is contra-indicated when version is contemplated.
- The author reports 2 deaths due to the anaesthesia which occurred in 600 cases of delivery during a period of five years. Persistent headache, vomiting, ocular and other palsies, and retention of urine have been rare and never serious.

WILLIAM P. VAN WAGENEN, M.D.

Ekas, W. L.: Traumatic Separation of the Symphysis Pubis. *Am. J. Obst. & Gynec.*, 1931, xxi, 680.

Separation of the symphysis pubis without further injury to the pelvis is very rare. If there is more than a small amount of separation the sacroiliac articulations are usually injured.

Rupture of the symphysis pubis, *per se*, is usually not serious, and as a rule is followed by satisfactory healing. It does not necessarily have a deleterious effect on labor and usually does not require operative measures.

Subsequent pregnancies may cause a recurrent partial separation, but again the separation may not affect labor and the end-result will usually be satisfactory.

The author reports two cases in detail. In the first case the use of a Balkan frame and hammock proved a very satisfactory mode of treatment. It made the patient comfortable, allowed her to move

in bed with certain limitations, and made the nursing care easier. The patient's weight when she was suspended in the hammock gave sufficient cohesive force.

E. L. CORNELL, M.D.

Dodek, S. M.: The Vertex Occiput-Posterior Position: A Review of More Than 500 Consecutive Cases. *J. Am. M. Ass.*, 1937, xcvi, 1660.

The vertex occiput-posterior position is a serious complication of labor.

Accurate diagnosis is the most important factor in the proper management of this malposition and should be simple. Abdominal palpation and auscultation combined with rectal examinations and close observation of the course of labor offer excellent aids toward accurate diagnosis in the great majority of cases. Vaginal examination is rarely necessary.

The occiput-posterior position occurred in 29.8 per cent of the 1,723 dispensary cases of vertex presentation seen in the Cleveland Maternity Hospital over a period of nearly twenty-one months. The ratio of right posterior to left posterior positions was 1:0.82.

Only a small minority of the fetuses in persistent occiput-posterior positions will rotate spontaneously after from two to two and one-half hours of second-stage labor. The fetal loss from intracranial hemorrhage after more than three hours of second-stage labor warrants correction of the malposition and delivery well before this period of time has elapsed.

Internal podalic version is the method of choice for the delivery of fetuses in persistent posterior positions in which the greatest diameter of the head is arrested at the pelvic brim. The high forceps operation is almost never done.

The Scanzoni maneuver as modified by Bill is a completely satisfactory method of rotating the fetus in persistent occiput-posterior position which has descended below the brim of the pelvis. It is attended by minimal danger to the child and causes no undue trauma or laceration to the maternal perineum. Perineal lacerations may occur only as a result of subsequent extraction.

A certain number of fetuses in posterior positions are arrested after describing an arc of 90 degrees and remain in the transverse diameter of the maternal pelvis. Rotation may be satisfactorily completed and extraction effected by a single cephalic application of the forceps.

Because of the complications that may attend displacement and manipulation of the head, manual rotation is not recommended. When these complications do not arise, the results are good.

Delivery of a fetus in the persistent occiput-posterior position as such is unnecessary and attended by danger to the child.

Of the 514 fetuses in occiput-posterior positions in the cases reviewed, 148 rotated spontaneously. Of the remaining 366, 59 were delivered by internal podalic version, 276 were rotated by forceps, 12 were rotated manually and extracted by forceps, 1

was delivered in a persistent posterior position, and 18 were delivered by cesarean section. The mortality among the full-term babies from all causes was 3.9 per cent. Pulmonary emboli caused 2 maternal deaths.

ROLAND S. CROON, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Placintianu: The Treatment of Late Postpartum Hemorrhage (*L'état actuel du traitement des hémorragies tardives du post-partum*). *Gynécologie*, 1937, xxx, 193.

Late hemorrhages are among the most grave complications of labor. They lead to serious anemia, and if they are accompanied by infection the prognosis is especially unfavorable. If possible, treatment should be delayed until an accurate diagnosis is made.

Digital examination is contra-indicated unless a diagnosis cannot be made in any other way. It should be attempted only if the cervix is permeable and then under conditions of the strictest asepsis. In cases of hemorrhage with retention in which the cotyledon is free in the uterine cavity, slow, careful, and aseptic digital extraction generally does not cause later complications. If the cotyledon is adherent, curettage is difficult and there is danger of perforation or septicemia. Moreover, it is difficult to cleanse the uterine cavity completely; many operation and autopsy specimens have shown bits of placenta even after what was considered a thorough curettage. Therefore in cases of adherent cotyledon, hysterectomy should be performed.

In cases of secondary hemorrhage of the metrorrhagic form during puerperal fever only local and general medical treatment should be given. In most cases such treatment is effective. In cases of hemorrhage that is severe from the beginning and is aggravated by medical treatment, the only successful treatment is abdominal hysterectomy followed by Mikulicz drainage. AUDREY GOSS MORGAN, M.D.

Runge, H.: The Treatment of Puerperal Peritonitis (*Die Behandlung der puerperalen Peritonitis*). *Deutsche med. Wchnschr.*, 1939, ii, 1989.

As conservative treatment of postpartum and postabortion peritonitis has a mortality of practically 100 per cent, the author operates in these conditions as early as possible. He considers in his discussion only cases in which free pus is found between the loops of intestine when the abdominal cavity is opened. Encapsulated and intraperitoneal collections of pus and purely pelvic peritonitis are disregarded. Surgical treatment is contra-indicated when the patient is moribund. The author has never operated when the infection was due to gonorrhea.

Possible causes of peritonitis are: (1) the migration of organisms from the cavity of the uterus through the uterine musculature or the tubes; (2) instrumental injuries with the transplantation of bacteria; (3) the rupture of a pyosalpinx or an ovarian abscess; and (4) the transmigration of bacteria through

necrotic areas in the uterine wall caused by the introduction of toxic substances for the induction of abortion. The author reports three cases of peritonitis due to the fourth cause.

The onset of signs of peritonitis following injections of soap is a definite indication for operative interference. It is seldom possible to determine the cause of peritonitis from the clinical examination, but this can be done at the time of operation. In the surgical treatment the time of the onset of the affection is of greater importance than the mode of origin. Of twelve of the author's cases in which operation was performed within twenty-four hours after the appearance of the symptoms, cure resulted in nine and death in three. Of five cases in which operation was done within forty-eight hours after the onset of the symptoms, cure resulted in one and death in four. Of eight patients operated upon later than forty-eight hours after the onset, all succumbed. Early diagnosis is as important in peritonitis following delivery or abortion as in surgical peritonitis.

The indications for surgical intervention include a noticeable change in the appearance of the patient during several hours of observation, a sudden increase in the pain, the onset of vomiting, and a change in the type of respiration. Diagnostic aids yield no reliable criteria for early diagnosis and cannot supplant clinical observation. Surgery is contraindicated by sepsis. Clinical observation over a period of several hours will often not permit a differential diagnosis between acute diffuse peritonitis and peritonitis of the local adhesive type. However, as was noted by Nuernberger, the latter type of peritonitis shows considerable improvement even after an exploratory laparotomy.

The type of the infecting micro-organism has no influence upon the subsequent treatment. A prognosis can seldom be rendered even after early intervention.

The operations to be considered are the radical supravaginal hysterectomy with drainage of the pouch of Douglas, salpingo-oophorectomy with drainage, and drainage alone. Supravaginal hysterectomy gives the best results and is the operation of choice in early cases. Vaginal drainage is facilitated by removal of the uterus. Having observed the development of an ovarian abscess four weeks after a supravaginal amputation, the author believes that oophorectomy should be performed simultaneously with this operation.

Postoperative treatment should be directed toward maintaining the circulation and the intestinal function. The author advises continuous intravenous infusions of a 5 per cent calorse solution. To stimulate peristalsis he gives tonephin. Atropin is also of value for this purpose. In gastric and colonic lavage, magnesium perhydrol or belladonna-neutralon is used. In all of the cases reviewed in which recovery resulted abscesses of the abdominal wall were formed. Infections of the Pfannenstiel transverse incisions at first presented a grave appearance, but abdominal hernia never developed. A. KOEHLER (G).

MISCELLANEOUS

Polak, J. O.: *Maternal and Early Infant Care*. *Am. J. Obst. & Gynec.*, 1931, xxi, 852.

While in certain urban centers of the United States the practice of obstetrics is comparable to the best in other countries, American women as a whole are not receiving the most efficient obstetrical care. It is apparent, however, that obstetrics is passing through a transitional stage, from surgical radicalism with its heavy toll to physiological conservatism in which, by careful antepartum study, instruction in the hygiene of pregnancy, intelligent interpretation of the laboratory findings in the toxemias, a broader knowledge of the physiological mechanism of labor, and the employment of strict surgical asepsis at delivery, maternal mortality will be reduced.

To achieve the best results, prenatal care must be improved by the organization of prenatal clinics staffed by a trained personnel. It would not be difficult to do this in the clinics connected with the large university hospitals which are well endowed, but giving adequate prenatal attention in the sparsely populated districts will always be difficult. Until the State, the physician, and the patient accept their individual responsibilities. The small hospital which is the medical center of the rural community could well establish both a free and a pay clinic for the instruction of prospective mothers. While each rural hospital must serve a region of considerable size, this disadvantage has been overcome by the use of the automobile. Physicians in charge of cases should have access not only to the hospital records, but also to the hospital facilities. Mothers' classes for antenatal instruction could be conducted in these centers. From such instruction the public would obtain a better knowledge of its responsibilities with regard to child-bearing women. After delivery, the woman should be kept under observation for a period of two months.

More opportunities for graduate training in obstetrics should be offered the general practitioner by the university clinics, and a nation-wide obstetrical program with the backing of the Federal Government, the State, the County Health Departments, and the national obstetrical groups and welfare agencies should be carried out. Any nation-wide obstetrical program must plan for the care of the following groups of patients:

1. Clinic patients, who receive care in clinics with consecutive prenatal, intrapartum, and postpartum services and completely organized medical, dental, nursing, and social service staffs.
2. Patients living in sparsely settled districts. These include the large negro population in regions of the South and the Southwest where no adequate obstetrical care of any type is given. The maternity program should be begun at the marriage license bureau where every applicant should receive a simple printed literature on the minimum standards of prenatal care, the importance of trained medical

attendance during labor, and information relative to the importance of periodical health examinations.

3. Women of the middle class, the great majority of whom do not care to go to free clinics.

4. Women in good economic circumstances. Such women are able to have the best if they know what the best is. Relatively few of this class besides those who live in the large cities are delivered in hospitals.

National schools of midwifery for white women as well as for the negro women should be established in connection with the rural hospitals in the districts in which midwives are necessary. In this plan the midwife should be responsible and should be supervised by trained obstetricians in their respective districts as in Scandinavia.

E. L. CORNELL, M.D.

Frank, C. W., and Kushner, J. I.: **Obstetrical Mortality. An Analysis of 2,268 Maternity Cases at the Bronx Hospital.** *Am. J. Obst. & Gynec.*, 1931, xxi, 708.

During the period from 1927 to the end of June, 1930, 2,268 mothers were delivered of 2,290 infants in the Bronx Hospital, New York. There were 6 maternal deaths, 52 stillbirths, and 30 deaths of newly born infants. The maternal mortality was therefore 0.27 per cent.

Cæsarean section was done in 23 cases (1.0 per cent), with a maternal mortality of 4.3 per cent.

Internal podalic version and extraction were resorted to in 25 (1.1 per cent) of the 2,268 deliveries, with a maternal mortality rate of 4.0 per cent.

Forceps deliveries were accompanied in 137 cases (6.04 per cent), with a maternal mortality of 0.67 per cent.

In the case of a patient who was delivered spontaneously of triplets, death was due to postpartum sepsis following the retention of secundines with subsequent infection.

The greatest number of fetal deaths (63), most of which occurred *in utero*, were due to asphyxia and atelectasis. The diagnosis of these deaths was based on clinical, X-ray, and autopsy findings. There were 9 cases of congenital anomalies. Eleven fetal deaths were due to toxæmia in the mother and 8 to prolapse of the cord.

The figures cited indicate a maternal mortality per 1,000 of 2.7, a stillbirth rate of 22, and a neonatal death rate of 13. The maternal and fetal deaths have been reduced at the Bronx Hospital by better care of the mother in the last three months of pregnancy and by conservatism during labor, interference being undertaken only when delay and procrastination might result in morbidity or death.

E. L. CORNELL, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Farrell, J. I.: A Study of Vesicorenal Reflexes and of the Possibility of a Renorenal Reflex. *J. Urol.*, 1931, xxv, 487.

Farrell reports a series of experiments performed on dogs to determine the presence of a vesicorenal reflex and the possibility of a renorenal reflex. He reviews the literature on the subject and describes the innervation of the urinary organs.

The first series of experiments were performed to determine the effect of overdistention of the bladder on the volume of the kidney and the urinary output. Distention of the bladder caused a marked inhibition in the flow of urine. When the distention was relieved there was rapid diuresis.

Stimulation of the pelvic nerve on the right side caused complete cessation of the urinary flow as long as the stimulation was continued, but there was no compensatory diuresis when the stimulation was stopped. Stimulation of the hypogastric nerve had no effect. In one of the experiments the dog voided spontaneously and during the active contraction of the bladder there was complete cessation of urinary secretion. The author ascribes the latter to a cessation of ureteral peristalsis and contraction of the ureteral musculature to prevent backflow to the kidneys.

In another series of experiments both of the splanchnic nerves were severed. In the dogs so treated neither bladder distention nor stimulation of the pelvic nerve influenced urinary secretion. The author concludes that the efferent phase of the reflex arc is carried by the splanchnics.

The author endeavored to prove the presence of a renorenal reflex by distending the pelvis of one kidney while watching the urinary flow from the other. He found that when the distention was produced suddenly there was a marked decrease in the urinary output of the opposite side, whereas when the distention was produced gradually it had very little effect.

IRVING J. SHAPIRO, M.D.

Scalabrino, R.: The So-Called Ureteral Exclusion in Tuberculosis of the Kidney (Sulla cosiddetta esclusione ureterale nella tubercolosi del rene). *Arch. ital. di urol.*, 1931, vii, 347.

It is generally agreed that chronic renal tuberculosis is always a secondary process; that the kidney becomes infected usually by way of the blood stream, infrequently by way of the lymphatics, and very rarely through the ureter; that the infection is generally unilateral; that as a rule the first localization of the infection is in the cortical substance; and that ureteral and vesical involvement are almost always secondary to the renal involvement.

The author's conclusions regarding the so-called ureteral exclusion in tuberculosis of the kidney are summarized as follows:

1. Ureteral exclusion in tuberculosis of the kidney is rarely due to total obliteration of the lumen (true anatomical or mechanical exclusion). When this type of exclusion is encountered the kidney presents in general the aspects of a fibrotic kidney and in the majority of cases shows no appreciable tuberculous lesions suggesting that the specific process is still active.

2. In the greater number of cases of ureteral exclusion the lumen of the ureter, however much reduced in caliber, is found to be still pervious after nephrectomy; hence the exclusion is functional or dynamic and dependent upon profound alterations in the muscular tunic of the ureter which are aggravated by similar lesions of the renal pelvis and hypofunction of the kidney brought about by the same specific cause. In consequence of these multiple alterations, the kidney is functionally blocked and hence clinically excluded even though continuity is still preserved.

3. However much from the histological standpoint this variety of exclusion may differ from the anatomical form, the clinical consequences of the two forms may be identical.

4. Spontaneous recovery from renal tuberculosis, although theoretically admissible, occurs very seldom. Because of the anatomicopathological considerations regarding partial and total exclusion which have been mentioned, such a recovery is to be regarded as only temporary.

5. Involvement of the ureter occurs by way of the lymphatics and is early and diffuse.

WILLIAM W. WHITLOCK, M.D.

Linkberg, A.: Renal Tuberculosis and the Results of Its Surgical Treatment in the Second University Surgical Clinic at Dorpat in the Period from 1921 to 1930 (Die Nierentuberkulose und die Ergebnisse ihrer chirurgischen Behandlung in der 2. chirurgischen Universitätsklinik 1921-1930). *Acta chirurg. Scand.*, 1931, lxxviii, 183.

After a brief review of the history of our knowledge of renal tuberculosis, the author describes the three ways in which the kidney becomes involved by the infection, viz., by the blood stream, the ureter, and the lymphatics. He then discusses the clinical symptoms and signs and the aids in the diagnosis.

Of forty-seven patients treated for renal tuberculosis during the past ten years at the second surgical clinic at Dorpat, twenty-nine were females and thirty-one were between twenty and thirty-five years of age. In 70 per cent of the cases tuberculosis was present also in some other part of the

body besides the kidneys. In more than half of the latter the bladder was infected. In the forty-two cases which were operated upon the mortality was 11.9 per cent (five deaths).

Of the thirty-six surgically treated patients who could be traced subsequently, 77.7 per cent reported that they felt quite well, while 5.5 per cent stated that they were suffering from severe tuberculosis of the bladder and kidney.

In discussing the relation between renal tuberculosis and pregnancy, the author states that pregnancy should be allowed only after complete recovery from the tuberculosis. According to Wildbolz this requires three years, whereas Kuemmel believes it requires four years. Linkberg emphasizes that even after a cure has been obtained the woman should become pregnant only if she is in a sound financial condition, so that, if the result is unfavorable, she and the child will not be thrown on the resources of the community.

BLADDER, URETHRA, AND PENIS

Kirwin, T. J.: Vesical Neck Obstruction; With the Presentation of a New Instrument for Its Relief. *Surg., Gynec. & Obst.*, 1931, lii, 1007.

Kerwin presents an instrument for dealing with obstruction of the vesical neck due to a median bar, prostatic middle lobe, contraction of the neck, postprostatism, or enlargement of the subcervical glands.

Up to the present time the greatest need in the removal of median bar obstruction has been a technique which will render the operation entirely or nearly bloodless.

The instrument described has an outer steel sheath equipped with a fenestra on one side and a curved beak. The usual obturator is replaced by an inner tubular structure which carries the McCarthy lens system, a high-frequency needle, and irrigating cocks. A tubular knife between the two sheaths acts as an obturator, rotating between the two parts described.

The advantages claimed for the instrument are summarized as follows:

1. The profuse hæmorrhage always heretofore produced by instruments of this type is prevented.
2. The amount of heat applied can be definitely regulated. Slow desiccation of the blood vessels eliminates sloughing.
3. The circular knife cuts in the direct contour of the bladder neck.
4. The view is never at any time obscured.
5. The lateral position of the knife makes possible the cutting of a larger section.
6. The needle which pinions the obstructing tissue permits fixation of the part to be operated upon.

JACOB S. GROVE, M.D.

Aschner, P. W.: Clinical Applications of Bladder-Tumor Pathology. *Surg., Gynec. & Obst.*, 1931, lii, 979.

From his study of bladder tumors the author draws the following conclusions:

1. Reliable information as to the nature of bladder tumors is obtained by cystoscopic biopsy in 97.7 per cent of cases. The unavoidable failures occur chiefly in cases of multiple tumors and papillomatosis.

2. In cases of malignancy the prognosis cannot be made from biopsy material alone.

3. A biopsy diagnosis of malignancy in a case simulating papilloma in its cystoscopic appearance and response to fulguration is an indication for more radical therapy (radium or surgery).

4. Bladder tumors may be classified in agreement with general tumor terminology and with clinical requirements. They are benign or malignant.

5. A classification based on cell grading alone is not as practical for clinical purposes, and a prognosis on such a basis does not coincide with the late results.

6. The presence or absence of infiltration appears to be a more reliable index of the gravity of the condition.

7. The site of the malignant tumor determines its resectability and thus materially influences the prognosis.

8. If a biopsy diagnosis of carcinoma is made and the case is considered surgical, segmental resection of the whole thickness of the bladder wall is the procedure of choice. Even in cases of pedunculated tumors, failure to perform such a resection has often resulted in recurrence. Stalk invasion and tumor cells in the blood vessels at the base cannot be detected by gross inspection.

9. Although histological studies suggest that papillary carcinoma develops from papilloma in a considerable percentage of cases evidence thereof is very equivocal.

10. Before radical surgery is undertaken for tumor of the bladder, biopsy should be done as other lesions may resemble neoplasm very closely.

Wolfrohm, G., and Monod, O.: The Treatment of Tumors of the Bladder by Irradiation (A propos du traitement par irradiation des tumeurs de la vessie). *J. d'uról. méd. et chir.*, 1931, xxi, 377.

The authors report on nine cases of tumor of the bladder treated by irradiation which were observed at the Curie Foundation. The first two patients had been treated before their admission to the Curie Foundation. They died. Of the seven others, who were treated solely at the Curie Foundation, the first four died. One of the latter was treated with the X-rays, and the three others with radium. In all four, the irradiation was followed by temporary improvement with a decrease in the pain, temporary arrest of the hæmaturia, and a more or less marked regression of the tumor. Three patients died of cancer less than a year after the treatment. One died suddenly during the year, probably from embolus, but the bladder lesion, which had at first diminished, was in full recurrence at the time of his death.

Of the three surviving patients, the first was treated with the X-rays in 1925 and seems at present

to be cured. The second was treated with radium in 1927. He suffers severe discomfort, presents considerable hypertrophy of the prostate, and does not seem to be cured of his vesical cancer. The third was treated with radium in 1929, and seems at present to be free from recurrence.

In all of the cases there was infection of the urine which made it more difficult for the patient to support irradiation. The irradiation diminished the vesical cancer in every case, but the dose seems to have been often insufficient. The hæmostatic action of irradiation is indisputable. In only three cases was it possible to confirm the diagnosis of epithelioma by microscopic examination. Biopsies by the endoscopic route are difficult. Malignancy of a tumor is generally revealed by the endoscopic appearance of the neoplasm, but the latter is not always dependable. The severity of the lesion is dependent, not upon its location, extent, or surface appearance, but upon the degree to which it infiltrates the vesical wall.

In the discussion of this report, MARION said that the implantation of radium needles by incision is not a harmless procedure and should be done only when the patient's resistance is good and the tumor is still limited. Three of Marion's patients treated by this method succumbed very quickly with symptoms of septicæmia. While the application of radium by the natural tracts has often been followed by very pronounced cystitis, the effects have been benign. Deep radiotherapy sometimes causes exhaustion, but has no more serious results.

Marion reported the cases of two patients who were apparently cured, one by fulguration followed by irradiation and the other by irradiation alone. The former was treated seven years ago and the latter five years ago. Another patient who was treated two years ago by fulguration and irradiation has clear urine, but refuses an examination, saying he suffered too much from the first treatment. Except in the two cases reported, Marion has obtained only temporary improvement from roentgen or radium irradiation. The application of radium by the natural passages is usually benign and has a remarkable effect on the hæmaturia. It may even make the tumor disappear temporarily. Roentgen therapy seems especially to be recommended for diffuse tumors. It may be combined with radium applications.

MARSON said that the application of radium in the bladder often causes the intolerable pain of cystitis. Although excellent results have been obtained by Darget from radium irradiation and by Heitz-Boyer from wide exeresis with the electric knife, the author is convinced that such results are rare. Except in cases of tumors of the fundus of the bladder, surgical intervention is not successful and may increase the suffering and hasten death.

Like Legueu, Marsan has used symptomatic medication in cancer of the bladder. The pain is relieved by opiate and belladonna suppositories. When there is much infection and the pain is severe,

cystostomy is done. The hæmorrhages and the advance of the lesions are arrested by the use of bromide of mesothorium combined, when possible, with electrocoagulation treatments at intervals of two weeks or a month. Patients so treated have been rendered more comfortable. In most cases the end-results have not been determined because, the patients, being treated in the ambulatory clinic, they have been lost sight of. However, Marsan has been able to trace several patients who were similarly treated in private practice. A man seventy-five years of age survived four years without a cystostomy. Another patient, who was cystostomized, led an almost active life for a year. As in this case the tumor invaded the lesser pelvis and compressed the rectum, it was necessary to make an artificial anus. The patient lived eighteen months with the double infirmity and died of anuria. His daughter said that he got out every day and did not appear to suffer much. A third patient lived two years and a half without a cystostomy. Fifteen days before her death she was writing for a magazine. She died of uræmia due to infection of both kidneys. Another patient, believed affected with cancer of the bladder, has remained well for eight years. For a year this patient had frequent hæmaturia. Two large mushroom growths of the bladder disappeared after electrocoagulation.

PAGE.

GENITAL ORGANS

Webb, J. C., and Mucklow, S. L.: Non-Operative Treatment of the Senile Prostate. *Lancet*, 1931, ccxx, 957.

Usually one of two alternatives is offered to patients for the symptoms associated with senile prostate: catheter life or operation. The authors propose deep X-ray therapy or diathermy plus static wave, or their combination. Prostatectomy often gives only partial relief and sometimes is followed by complications or shock. Moreover, the patient's age is itself a source of danger in operative treatment.

There are two distinct types of simple senile prostate: the large, elastic, or soft prostate, and the small, hard prostate. The question arises whether these are separate conditions or whether there is always a preliminary increase of adenomatous elements with subsequent replacement of the glandular portion by fibrous tissue. Whatever its origin, simple enlargement of the prostate resembles, grossly and histologically, an adenoma with a varying amount of cyst formation. Hence it may be assumed that the soft hypertrophied prostate is definitely adenomatous and characterized by the new formation of epithelial cells. The fibrous prostate is the result of inflammation occurring in two distinct ways. In some cases, an adenomatous condition beginning in the prostate results in dilatation of the periurethral gland ducts with sepsis invading the prostate from the urethra and consequent hyperplasia, overgrowth of connective tissue, and obliteration of glandular tissue. In other cases, excessive

fibrous tissue results from irritation of chronic prostatitis by excessive riding, masturbation, or sexual excess.

The symptoms are well known. The early frequency is almost certainly due to nerve irritation associated with hyperplasia of the lining epithelium of the prostatic urethra and the internal vesical sphincter.

Non-operative treatment is based on: (1) the selective action of rays of short wave-length in destroying newly formed cells and leucocytes; (2) the effect of diathermy in promoting increased circulation in the part treated; and (3) the action of the Morton wave in causing cellular contraction (histological massage), thus aiding the increased circulation to dispose of the debris of cells destroyed by the X-rays.

The treatment is indicated by all early cases and for later cases without much residual urine and without definite intravesical enlargement as shown by cystoscopy. A large amount of residual urine, enlargement of the bladder, and evidence of back-pressure on the kidney and of cystitis are contra-indications. If benefit results from the treatment, it should be repeated if the symptoms recur.

In the treatment used by the author, 200 kv. are applied through the perineum to two inguinal fields and two fields on either side of the coccyx. Only four-fifths of the unit skin dose is given to the perineum, but the full dose is given to the other fields. The rays are directed through the inguinal regions and the abdomen is protected by a central strip 3 in. wide to prevent damaging the skin for subsequent operation. The supplementary diathermy and static applications are begun as soon as the radiotherapy is completed and are given daily on alternate days for three weeks. If the prostate is small and hard, the combination of diathermy and static wave may suffice. Radiotherapy has but little effect on the purely fibrous prostate. In the absence of the contra-indications mentioned, deep radiotherapy with or without diathermy and static wave is employed. This non-surgical treatment is indicated also in early cases, those in which the condition of the heart or lungs, the general condition, or the patient's age contra-indicates operation, and those in which operation is refused unless it is absolutely necessary.

LOUIS NEUWEIT, M.D.

Pugh, W. S.: The Seminal Vesicle and Its Diseases.
Med. J. & Rec., 1931, xv, 383.

Pugh believes that in the majority of cases of acute gonorrhoea the infection spreads to the posterior urethra, and that, in over 75 per cent of the cases with such a spread of the condition, unilateral or bilateral seminal vesicle involvement occurs. He is of the opinion that those who find involvement of the seminal vesicles only infrequently either do not look for it or do not recognize it.

Among other causes of seminal vesiculitis besides gonorrhoea, the author accords first place to the practice, in sexual intercourse, of withdrawal just

prior to ejaculation. He has known seminal vesiculitis to occur also as the result of ungratified sexual desire.

Seminal vesiculitis may give rise to low back pain and pain in the groins. In industrial cases it is frequently diagnosed as sprained back or industrial hernia. The symptoms in the acute and subacute stage include a low grade fever, headache, backache, and malaise. The urinary symptoms are inseparable from those of the co-existing prostatitis, namely, frequency, urgency, and dysuria. Blood-stained emissions are common. In the chronic stage, the chief symptom is low back pain which sometimes radiates down the legs. This is caused by swelling of the seminal vesicles due to interference with drainage.

The author emphasizes the importance of rectal examination in the diagnosis. The prostate and vesicles may become matted together by the extensive inflammation. Pus may not appear in the expressed secretion until after the second to fifth massage, that is, not until the pockets of infection have been opened up.

The author believes that fully 75 per cent of backaches in males are of seminal vesicle origin.

Because of the close relationship of the seminal vesicles and the ureters, disease of the seminal vesicles may cause ureteral obstruction. Ureteral obstruction due to the seminal vesicles is more common than is generally believed.

For treatment of the seminal vesicles, the author advises massage and the use of sounds and antiseptic solutions in the bladder and urethra. He emphasizes that care must be taken not to do too much at one treatment because of the danger of causing epididymitis. He considers the use of diathermy a useful adjunct to the other measures mentioned.

He believes that surgery directed against the seminal vesicles is greatly overdone and should be undertaken only with great caution and in selected cases. Of 365 vasostomies performed by him, 65 per cent failed. Pugh ascribes the frequency of their failure to the fact that the disease is in great part a perivesiculitis which is not reached by antisepsis injected into the lumen of the vesicle.

Pugh believes that seminal vesiculectomy and vesiculectomy are indicated in severe persistent gonorrhoeal arthritis, and that vesiculectomy is indicated in tuberculosis of the seminal vesicles. He discusses the technique of vesiculectomy in some detail and advocates the procedure described by Hunt.

Another method of treatment is catheterization of the ejaculatory ducts through an endoscopic tube. Solutions may be injected in this way for diagnostic or therapeutic purposes.

Pugh reports a case of primary carcinoma of the seminal vesicle which could be treated only by palliative cystostomy.

In conclusion, Pugh emphasizes the importance of seminal vesiculitis as a complication in the per-

formance of prostatectomy. He believes that infection of the seminal vesicles is present in fully 25 per cent of cases coming to prostatectomy, and that persistence of the symptoms following the operation may be due in great measure to this infection.

IRVING J. SHAPIRO, M.D.

Roper, R. S.: Gonococcal Infection of the Seminal Vesicles. *Lancet*, 1931, cxxx, 793.

Catheterization of the ejaculatory ducts is rendered difficult by poor visibility of the ducts, the yielding of the verumontanum, and the resistance offered to the passage of the catheter along the duct even after perfect engagement in the orifice. To overcome these difficulties the author proposes the use of a special urethroscope, by means of which it has occasionally been found possible, in experiments on the cadaver, to pass a No. 3 F. catheter far enough to inject the vesicles. Because of its small caliber and the precision with which a catheter or diathermy electrode can be manipulated, this instrument is valuable also for operative work in the posterior urethra.

The seminal vesicle is one of the most complicated sacs in the body and when infected can be effectively drained in only about 15 per cent of cases. Diverticula are an impediment to complete cure of infection and account for the chronicity of vesiculitis. They may be responsible also for an unaccountable relapse after months or years of freedom from symptoms. The relapse may occur after coitus with a partner showing no trace of infection. In such cases it seems probable that pus is liberated from a diverticulum and fresh infection of the mucosa results. The tube bends on itself, producing many shelves, and although fluid enters easily from the vas, evacuation of the vesicles through the ejaculatory duct by digital pressure is not easy.

It is not known whether the spread of infection occurs by way of the lymphatics, by continuity of the mucosa, or by the blood stream. That it may arise from too forcible injection during treatment appears not improbable. If the spread is direct, there is good reason for the belief that in epididymitis the vesicle is always infected as the infection must pass across the vesicular orifice which is comparatively large.

In 90 per cent of the acute cases there is an associated posterior urethritis, but the latter may be silent and may heal completely during treatment. The symptoms of a more acute infection, such as strangury, dysuria, cessation of the discharge, and perhaps a little hæmaturia during the first week of an acute attack or three weeks after infection should arouse the suspicion that the infection has spread to the vesicles. Vesicular infection is not looked for often enough; a serious constitutional disturbance at the beginning of acute gonorrhœa is more often ascribed to lack of resistance than to infection of the urinary tract. Infection of a sac such as the seminal vesical causes constitutional disturbances if drainage is poor. When drainage is good and the

infection clears up quickly it is often not suspected. The possibility of subsequent chronic vesiculitis should also be considered and, after convalescence, a searching examination for this condition should be made. There are no pathognomonic symptoms.

In the rare cases of acute spermatocele, the blocking of the ejaculatory duct and spread of infection into cellular tissue there are symptoms of serious illness—a high temperature, perineal rectal pain relieved by urination, and frequent micturition. In the milder forms there may be hæmospermia (rare) and priapism. The pain is more likely to be due to associated prostatic infection. There are few signs, and rectal examination is unhelpful in appointing as the acutely inflamed vesicle is not palpable. However, if rectal examination is made during the acute stage of severe gonorrhœa with the patient in the knee-elbow position a significant finding is a turgescence sometimes felt spreading above the prostate and obliterating its characteristic outline.

The history of an undoubted chronic vesiculitis generally shows that during the original attack there was an epididymitis with high temperature or joint pains. French urologists regard relapsing epididymitis occurring first on one side and then on the other as pathognomonic of vesiculitis. The usual symptoms of chronic vesiculitis are a most inveterate gleet, chronic haziness of urine, and rheumatism following a troublesome gonorrhœa. Gleet may be the only symptom. Macroscopic examination may show that most of the pus from the meatus is degenerated, but staining fresh pus cells may also be seen. Organisms of secondary infection and occasionally gonococci are found. The intermittent appearance of gonococci necessitates repeated examination for them. The discharge may be intermittent and yield quickly to urethrovaginal lavage. Haziness of the urine is suggestive, but the urine may also be clear. Hæmospermia is uncommon, but by some is considered pathognomonic. Symptoms may be almost absent, but the condition may be revealed only accidentally. The anterior urethra should be thoroughly explored for folliculitis and the posterior urethra for abscesses and pockets which drain poorly. Rarely, pus may be seen exuding from the ejaculatory duct. Posterior urethroscopy should be done at least a fortnight before the vesicles are investigated because examination may produce hazy urine for a few days.

In massage of the vesicles, care must be taken not to reach the upper margin of the prostate. In cases of vesiculitis the vesicle cannot be felt, but massage should be done along the upper margin of the prostate. For palpation of the ampulla of the vas, the beginning V-shaped portion of the prostate should be sought; sometimes a thickening is palpable there. In fat subjects, efficient massage of the vesicle is often difficult and the finger fails to reach beyond the middle of the prostate.

Macroscopically, the saline solution injected into the bladder previous to the massage may be colored

or cloudy with solid particles. The cloudiness may be due to phosphates or free pus. Characteristically, the saline solution shows large flocculent masses in the shape of complete casts. Persistent haziness of the saline solution without obvious infection of the prostate indicates vesicular infection. Culture and microscopic examination of the secretion may reveal gonococci and pus. This examination should be repeated several times.

Patients with acute gonococcal infection of the seminal vesicles with symptoms of septicæmia and arthritis should be confined in bed. Deep perineal pain and the discovery of an abscess in the region of a vesicle on rectal examination are indications for drainage. In milder cases, rest in bed is imperative. Local treatment of the urethra and massage are contra-indicated. When there is a considerable urethral discharge, anterior irrigation should be done by the surgeon. Vasotomy may be tried.

In chronic cases the most important treatment is massage of the vesicle for months rather than weeks. Before the massage the bladder should be filled with a weak antiseptic such as a 1:8,000 solution of oxycyanide of mercury. For diagnosis and at periodic intervals this should be replaced by saline solution. If the expression fluid contains pus threads or shows a general haze due to free pus, massage should be done twice weekly. Diathermy is of value only to relieve symptoms. Gonococcal vaccine in doses of from 500 to 1,000 millions may help, but by itself is useless.

Vasotomy may lead to stricture of the vas. In America, vasopuncture is preferred. In the author's opinion, vasotomy is the method of choice. The antiseptics used for injection include 5 to 10 per cent collargol, 5, 10, and 25 per cent argyrol, 1 to 2 per cent silver nitrate, and 20 per cent silver protein (Thomas). Some urologists advocate bilateral vasotomy. Recurrent epididymitis on one side points to infection of the ampulla and vesicle of that side and indicates a single vasotomy. The indications for vasotomy are: (1) protracted cases lasting over five months in which other treatment has failed, especially if rheumatism is present; (2) resistant cases in which a deep perineum prevents effective massage of the vesicles; (3) cases in which the co-operation of the patient during a long course of treatment is doubtful and the disease is disabling; and (4) cases in which sterility has been established by bilateral epididymitis. LOUIS NEUWELT, M.D.

Cabot, H., and Nesbit, R. M.: Undescended Testis: Principles and Methods of Treatment. *Arch. Surg.*, 1931, xxii, 850.

Failure of the testis to descend has been attributed to paralysis of the muscle fibers of the gubernaculum, faulty attachment of the gubernaculum to the testis, absence of the gubernaculum, obstruction in the inguinal canal from narrowing of the entire canal or stenosis of the external ring, adhesions between the peritoneum and the testis, epididymis, or spermatic cord, shortness of the spermatic vessels, faulty posi-

tion of the fetus *in utero*, and abnormalities of the testis or epididymis.

In operations for the correction of non-descent of the testis the shortness of the spermatic vessels offers the greatest obstacle to placing the testis in the bottom of the scrotum.

The undescended testis is generally found to be somewhat smaller and softer than normal. As a rule there is an associated indirect inguinal hernia.

All undescended testes eventually undergo morphological and functional changes. The further the pre-adolescent testis has descended in its normal route, the more normal it appears histologically. The younger the age at which a retained gland is examined, the more nearly normal is its morphological appearance. The interstitial cells of Leydig are apparently not influenced by the abnormal situation of the retained testis.

Orchidopexy is probably best performed before the age of nine years, but even after puberty and as late as the third decade it may save a gland capable of spermatogenesis. On account of active interstitial cell development in these glands, orchidectomy should never be considered at any age.

Cabot and Nesbit describe a method of orchidopexy in which permanent lengthening of the vessels is obtained by continuous traction by means of sutures attached to a wire frame and rubber bands.

JACOB S. GROVE, M.D.

Levinson, A.: Gangrene of the Scrotum in Infants and in Children. *Am. J. Dis. Child.*, 1931, xli, 1123.

The following 4 types of gangrene of the scrotum are distinguished:

1. Gangrene due to systemic disease.
 - A. Infectious diseases such as measles, influenza, malaria, pneumonia, typhoid, variola, and varicella.
 - B. Metabolic diseases, such as diabetes. Of the 203 cases found in the literature by Coenen and Przedborski, 21 were of this type.
2. Gangrene due to urinary extravasation and infiltration. Twelve such cases were found in the literature by Coenen and Przedborski.
3. Gangrene due to trauma to the genital organs or the buttocks from mechanical, chemical, or thermal agents. Twenty-eight of the 203 cases found in the literature by Coenen and Przedborski were of this type.

4. Gangrene due to a local inflammatory process. This may be subdivided into:

A. That caused by an infection of the genital organs such as erysipelas or a local abscess.

B. That due to inflammatory processes not primarily located in the genitalia, such as umbilical infections.

C. That due to an undetermined cause, the so-called spontaneous gangrene. Coenen and Przedborski found that 142 of their collected cases belonged to this group. As streptococci were frequently found in the gangrenous area, Esau concluded that most of the cases were due to erysipelas.

To the 25 cases of gangrene of the scrotum in children which have been reported in the literature up to the present time, the author adds the cases of 2 infants sixteen days and eighteen months old respectively. The youngest of the 27 children was five days old, and the oldest fourteen years. One of the cases was of the first type, 1 was of the second type, 4 were of the third type, and 19 were of the fourth type.

Of the cases of Type 4, 14 were due to local infection and 5 to a remote infection (umbilical infection in 4 and abscess of the leg in 1).

The mortality of gangrene of the scrotum of all types and occurring at all ages was 22.1 per cent in the cases reviewed by Coenen and Przedborski and 32.1 per cent in those reported by Randall. Of the 25 infants and children whose cases have been reported in the literature, 17 (68 per cent) recovered and 7 (28 per cent) died. The result in 1 (4 per cent) is not known.

There is no standard treatment for gangrene of the scrotum. The author believes that a surgical solution of chlorinated soda is of value.

C. TRAVERS STEPITA, M.D.

MISCELLANEOUS

Watson, E. M.: Sinus Tract Carcinoma. *J. Urol.*, 1931, xxv, 469.

Watson reports two cases in which carcinoma developed in a suprapubic fistula secondary to suprapubic cystostomy performed on account of stricture of the urethra. In one, the stricture was of traumatic origin, and in the other was a sequela of gonorrhoeal infection. In neither case was there any evidence of bladder involvement. One of the patients was treated by operative excision of the lesion followed by radium and deep X-ray therapy. He died three months later, evidently from generalized carcinomatosis. The other was treated by the implantation of radium followed by extensive deep X-ray therapy. He developed an incisional hernia and succumbed to an operation performed two years later for the latter condition. No evidence of recurrence was apparent at the time of his death.

The author was unable to find any record of similar cases in the literature, but cites three cases of carcinoma secondary to a perineal urinary fistula.

IRVING J. SHAPIRO, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Del Buono, P.: Changes in the Bones in Reticulo-Endotheliosis (Di alcune particolari alterazioni scheletriche nelle reticulo-endoteliosi). *Radiol. med.*, 1921, xxxviii, 588.

In America, reticulo-endotheliosis is called Schueller's or Christian's disease, but the first case was described by Hand in 1893. The condition is characterized by softening of the bones of the skull, polyuria, and exophthalmos. In Hand's case, that of a child three years of age, a severe attack of measles was followed by arrest of growth, thirst, polyuria, bilateral exophthalmos, weakness, bronzing of the skin, and an eruption on the abdomen resembling that of scabies. Death resulted from bronchopneumonia. Autopsy showed zones of softening of the parietal and frontal bones of the skull due to a mass of yellow substance which had originated in the dura and eroded the bone.

Schueller's earliest cases were reported in 1915. The first was that of a sixteen-year-old boy who, at the age of six years, had fallen from a height of 4 meters and struck on his abdomen. The accident was followed by nocturnal enuresis, arrest of growth, and the signs of beginning adiposogenital dystrophy. Palpation then revealed softening of the parietal bones of the skull and roentgen-ray examination of the skull showed zones of transparency in these bones. On both sides of the clavicles there were soft masses beneath the skin which appeared to be lipomata.

Schueller's second case was that of a child five years of age who, at the age of two years, had had a severe attack of convulsive coughing followed by exophthalmos, thirst, polyuria, and moderate enlargement of the liver and spleen. Physical examination disclosed zones of softening in the skull, particularly in the parietal bones. Roentgen-ray examination showed complete disappearance of substance in the parietal bones and erosions of the sphenoid and the roof of the orbit. Similar destructive lesions were found in the pelvis and the upper third of the right femur. The optic nerve was atrophied. The Wassermann reaction was negative.

The author reviews also the other cases that have been reported in the literature, about thirty in all. He concludes that the syndrome is caused by an accumulation of fat in the bones and parenchymatous organs brought about by hypertrophy of the reticulo-endothelial cells as the result of disturbances of fat metabolism. The best treatment is roentgen therapy. Irradiation may act directly or indirectly through the vegetative centers of the midbrain.

AUDREY GOSS MORGAN, M.D.

Jura, V.: Filtrable Osteomyelitic Virus (Sul virus filtrabile osteomielitico). *Polidin.*, Rome, 1931, xxxviii, 184.

The author reports experimental data which refute the arguments against the existence of an osteomyelitic ultravirus—that the lesions found in rabbits after the use of such a supposed ultravirus are due to the potassium nitrate used for the plasmolysis of the bacteria; that filtrates of cultures of staphylococci do not produce these lesions; and that the lesions are only irritative lesions caused by toxins and are not inflammatory.

Jura was able to produce osteomyelitic lesions in rabbits with filtrates of micro-organisms from cases of osteomyelitis but not with filtrates of ordinary staphylococci, and he succeeded in transmitting the infection from these rabbits to others with material containing no visible or cultivable micro-organisms. He was unable to find a toxic substance in broth filtrates of ordinary staphylococci that caused lesions resembling those of osteomyelitis.

There seems to be a symbiosis between the ultravirus and the bacteria, the ultravirus being inside the bodies of the bacteria and separable from them. This may explain why infection cannot be produced by filtrates from all colonies. In some, it may be impossible to demonstrate the ultravirus biologically because it cannot be separated from the bacteria.

Agglutination experiments showed that not only bacteria from osteomyelitic foci in man, but also other bacteria, could be agglutinated with the serum of osteomyelitic persons after contact for varying periods of time with filtrates of cultures of bacteria from osteomyelitic lesions. These filtrates had of course been tested and proved capable of producing osteomyelitis in young rabbits. Other experiments proved that the virus is cultivable in lymphocytes.

In Jura's opinion, the study reported in this article shows that an ultravirus which may cause osteomyelitis exists in symbiotic synergism with pyogenic cocci. AUDREY GOSS MORGAN, M.D.

Casazza, R.: The Roentgen Appearance of Certain Bone and Joint Changes in Syphilis (Considerazioni sugli aspetti radiologici di alcune alterazioni osteo-articolari in luetici). *Radiol. med.*, 1931, xviii, 565.

The author describes a number of bone and joint lesions found in syphilitic patients, calling attention to the great variety of such lesions and the difficulty of proving that a bone or joint disease in a syphilitic person is caused by the syphilis. The case reports are supplemented by roentgenograms.

The first case was that of a seven-year-old child with hereditary syphilis. In the vault of the skull there was a rather soft area, the size of a quarter,

which had an elevated border. Pressure on this area caused pain. The roentgenogram showed serious destruction of bone. None of the other bones of the skeleton was affected. The child was mentally defective. His mental condition and the bone lesion improved greatly under treatment with bismuth.

The development of bone syphilis seems to depend on both a general and a local factor. This was indicated by a case of acquired syphilis in a man of twenty-five years who showed distinctly productive lesions in the tibia and distinctly destructive lesions in the superior maxilla. The difference is attributed by the author to a local factor.

In the case of a man sixty-five years of age the bones of the skull and the distal ends of the bones of the forearms and legs were thickened and enlarged, evidently as the result of the general action of the virus, and serious lesions were present in the kidneys and circulatory system.

In syphilitic persons, trauma may cause localization of the syphilis in the bones. Illustrative cases are cited. Also cited are cases of joint lesions in syphilitic persons in which it was impossible to prove that the joint disease was caused by the syphilis. The author characterizes the joint disease in such cases as arthropathy in a syphilitic rather than as syphilitic arthropathy. However, he believes that in the cases cited the preponderance of evidence indicated that it was syphilitic. As known syphilitic changes are not always corrected by specific treatment, this theory is not disproved by the fact that in some of the cases the condition did not react very well to anti-syphilis treatment.

AUDREY GOSS MORGAN, M.D.

Leadbetter, G. W.: Periosteum: A Living Bone Suture. *Arch. Surg.*, 1931, xxii, 754.

Non union and delayed union occur much more often in cases of fracture in which reduction is effected by operation than in those in which closed reduction is done. For many years their greater frequency in surgically treated cases has been attributed to the use of artificial sutures. Groves' experimental work showed that after operative intervention sepsis is not infrequent, and that non-union and delayed union occur in from 40 to 50 per cent of cases because of interference with the circulation in the ends of the bone fragments. The use of absorbable materials is frequently followed by delayed union because these substances bend or break before sufficient callus has been formed to immobilize the fragments. In the early stages of bone repair, periosteal callus is important. The heaviest and strongest callus, resulting in late repair and permanent union, is thrown out by endosteal and medullary bone. The fixation of fragments of bone by early periosteal proliferation aids materially in increasing the circulation and hence acts as a stimulant to the permanent and strong endosteal callus.

Of seventy-six cases of open reduction of fractures of the long bones reviewed by the author, delayed

union and non-union occurred in 82 per cent of those in which suture was employed and in only 13 per cent of those in which suture was not employed.

Good apposition of the fragments is essential for satisfactory repair. Proper fixation is often difficult to obtain. An adequate blood supply, both periosteal and medullary, must be preserved. To stimulate the circulation, early mobilization is important.

In a large number of cases of fracture reduced by operation internal fixation is necessary. As the use of absorbable sutures has been unsatisfactory and delayed union and non-union are rare in fractures well reduced without operation or reduced by open operation without suture, it appears that an autogenous suture would be best. Fascia lata has been used as an autogenous suture, but does not stimulate early callus formation.

The ideal bone suture must be strong, easily obtained, non-irritating, autogenous, osteogenic, and easily introduced.

The author studied the tensile strength of periosteum, kangaroo tendon, and several varieties of chromic catgut after they had been immersed in physiological salt solution. The kangaroo tendon and catgut absorbed the fluid and showed a rapid decrease in strength directly proportional to the length of time they had remained in the salt solution. The periosteum was not weakened and was found also to meet the other requirements of a satisfactory living bone suture. Periosteum grows best when it is in contact with bone and regenerates early in fracture repair, thereby aiding the blood supply and fixation.

In his experimental studies of periosteum as suture material, the author used rabbits because these animals were found to be less susceptible to ordinary infections than other animals and because their bones unite quickly. In all of the experiments the bone fractured was the tibia. This was fractured manually before it was exposed. The periosteum was used in different ways. In some of the animals the medullary cavity was plugged with bone wax and the periosteal flap was carried across the point of fracture, care being taken to oppose the osseous surface of the periosteum at its point of contact with the cortex of the tibia. Sometimes the leg was immobilized in coaptation splints or heavy adhesive plaster cast and sometimes it was loosely bandaged with gauze. The rabbits were allowed to move about freely. They were all healthy and had not been used for other experimental purposes.

From the findings of these experiments the following conclusions are drawn:

1. A periosteal graft including small fragments of cortical bone lives and proliferates when it is opposed to autogenous bone *in situ*.
2. Periosteum is an early proliferative agent in the healing of fractures.
3. Splinting materially affects the formation of periosteal callus as the periosteum is much more dense and tends to proliferate more actively in cases with careful splinting and immobilization.

4. Endosteal callus appears relatively late in the healing of fractures.

5. Endosteal proliferation advances more rapidly and forms a firmer union when fixation is strong and when it is stimulated by an abundant early periosteal callus.

The author has used periosteal sutures also in several clinical cases of fractures of the olecranon, a case of ununited fracture of the humerus, a case of delayed union of the ulna, and a case of delayed union of the tibia. The operative technique was that of the insertion of any operative material. The periosteum was obtained from the broad anterior surface of the tibia. The results were uniformly good.

Leadbetter does not contend that the periosteum itself is the curative agent in fractures, as unquestionably the only permanent and strong repair comes through the channels of endosteal or medullary callus. However, the endosteal or medullary callus appears relatively late and a strong, non-irritating suture which will not disturb the circulation is necessary for early fixation. The periosteal suture cannot be depended upon alone. All of the generally accepted methods used in open reduction must be employed. The periosteal suture should be used only in selected cases. It appears to be applicable to fractures of long bones which do not bear weight, especially fractures of the radius and ulna which have resisted one or two attempts at closed reduction. ROBERT C. LONERGAN, M.D.

Kortzeborn, A., and Hesse, F.: *The Treatment and End-Results in Non-Specific Suppurative Inflammations of the Large Joints* (Behandlung und Endausgänge der unspezifischen eiterigen Entzündungen der grossen Gelenke). *Arch. f. klin. Chir.*, 1931, clxiv, 95.

The authors divide non-specific suppurative inflammations of the large joints according to the classification of Payr and Fisher into simple inflammatory and exudative joint affections, including purulent synovitis, and capsular phlegmons of a parenchymatous or destructive nature.

In the treatment of threatening or manifest acute joint suppuration, conservative methods have proved of great value. They include sterilization of the joint cavity (usually with phenol-camphor), maintenance of a closed joint cavity, thermotherapy, and early mobilization. In cases of bacteriologically or clinically sterile joint effusions these measures have given excellent results. While it cannot be proved with certainty whether an infection has been present or not in such cases, it is important to combat infection by the injected antiseptic. In the first of the three groups into which they divide their cases the authors include also traumatic joint effusions. Of four cases of effusion in the elbow, healing resulted with complete function in two and with insufficient function in two. One of the latter might have been a case of gonorrhœal arthritis. Function was incomplete also in the single case of inflamma-

tion of the wrist which might have been gonorrhœal arthritis. Of the sixteen cases of knee-joint effusion, complete function was restored in thirteen. In one case function was insufficient, and in two cases it was partial.

In the cases of Group 2, which included all true and, for the most part, bacteriologically proved, suppurations, the end-results were considerably less favorable. In this group also conservative treatment was used. Of the nineteen cases, complete function was obtained in four and partial function in four. In four others, the joint became ankylosed. In six cases the patient died. Most of the deaths were due to generalized infection. In one case a flail joint resulted.

In Group 3, in which the end-results were least favorable, the authors included the cases of total suppuration of the joint with rupture of the pus through the capsule and the cases of primary phlegmon of the capsule. The results supported the theory that an infected joint, once opened to any considerable degree, is doomed to immobility. The opposing view advanced by Willems is supported by a few foreign surgeons. Willems' method has not been tried at the Payr clinic, but the authors believe that diseased joints which retain their function after Willems' method are treated successfully at the Payr clinic by more conservative procedures. In all of the authors' thirty-five cases in Group 3, wide radical opening of the joint was necessary. The indication for this treatment is established by the clinical picture—extension of the infection to other parts of the capsule, rupture of the pus into the nearby muscles, the beginning of general septic symptoms or the sudden appearance of such symptoms with a rapidly developing capsular phlegmon, gas phlegmon, or a putrefactive process in the joint. A sufficient outlet for the pus must be provided, if necessary by opening the posterior space. Occasionally, extension is indicated, but in all cases absolute immobilization is necessary to obtain ankylosis of the joint in a favorable position. If the phlegmon continues to extend, the limb must be amputated. Of the thirty-five cases in Group 3, complete function was obtained in one, partial function resulted in eight, ankylosis developed in twenty, and death occurred in seven. The most severe functional disturbances were caused by infections due to the streptococcus brevis and the staphylococcus aureus. WANKE (Z).

Burns, B. H.: *Osteochondritis Juvenilis of the Lower Ulna Epiphysis*. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 912.

Burns reports a case of osteochondritis juvenilis of the lower epiphysis of the ulna in a boy ten years of age. The roentgenograms, which are included in the article, show that the epiphysis was enlarged, irregular, somewhat sclerosed, and fragmented.

The wrist was immobilized in a light plaster cast for a year, during which time the tenderness, swelling, and pain subsided. PAUL C. COLONNA, M.D.

Geist, E. S.: The Intervertebral Disk. *J. Am. M. Ass.*, 1931, xcvi, 1676.

Much information regarding the spine and intervertebral disks has been gained in the past five years from the work of Schmorl of Dresden. There are 23 intervertebral disks. In a man 6 ft. tall they make up about 5 in. of the height. The intervertebral disks constitute 40 per cent of the cervical portion of the spine, 20 per cent of the thoracic portion, and 33 per cent of the lumbar portion. They aid in the motion of the spine; in fact, motion would be impossible without them. Each disk consists of 3 parts: (1) the nucleus pulposus, (2) the annulus fibrosus, and (3) the cartilage plate. The nucleus pulposus, which is slightly behind the median line, is composed of a semi-fluid substance with a few cartilage cells. It is the remains of the notochord. Although it grows smaller with age it never disappears. The annulus fibrosus is a fibro-cartilaginous structure constituting the main bulk of the disk. It is firmly attached to the periphery of the vertebral body. The cartilage plate comes into contact with the surface of the vertebral body, but is only loosely attached to it.

The nucleus pulposus is a sort of water pillow under internal pressure which acts as a shock absorber. When opened up in the cadaver, it quickly bulges, and when put into cold water it swells to 4 times its original size. It is the fulcrum about which vertebral motion occurs. The annulus fibrosus is the weight-bearing portion of the disk. The cartilage plate may be considered a limiting membrane on each side.

Congenital anomalies of the disks are rare. The anomaly which is seen most often consists of the remains of the notochord attached to a disk and extending into the adjacent vertebra. Calcification of the disks may occur, but is very unusual.

The intervertebral disks play an important part in several pathological conditions of the spine. Prolapse of a disk into a vertebra may occur as the result of injury or destructive disease of the bone. Schmorl found it in 38 per cent of 3,000 cases. Such prolapses vary greatly in their extent. A walling-off process occurs around them, but they never disappear. There is a difference of opinion as to whether they cause symptoms. Geist has found them in the roentgenograms of nearly all cases of chronic back strain.

In adolescent kyphosis, multiple cartilage prolapses are usually found and the disks show many remains of the notochord. In senile changes, the disks become thin, the patient loses height, and ankylosis may occur. In chronic spondylitis, the disks undergo prolapse or degeneration.

The disks may be injured in fractures. This occurs most often in the lumbar region, less often in the cervical region, and least often in the dorsal region. When the disks are completely destroyed, secondary changes of spondylitis occur.

No definite relation between scoliosis and disease of the disks has yet been demonstrated. In many

diseases such as tuberculosis, carcinoma, and osteomyelitis of the spine and Charcot spine, the disks completely disappear. WILLIAM ARTHUR CLARK, M.D.

Belden, W. W.: The Fifth Lumbar Vertebra Roentgenologically Demonstrated. *Radiology*, 1931, xvi, 905.

The frequency with which patients complaining of low back pain are referred for roentgen-ray examination of the lumbar spine led the author to undertake an investigation of the fifth lumbar vertebra from the roentgenological standpoint. Text-books on anatomy give only meager descriptions of this vertebra, but call attention to its numerous anomalies. The author cites the work done by George and Leonard who constructed a composite average normal fifth lumbar vertebra from the findings in a large number of apparently normal persons.

The most common congenital variations of the fifth lumbar vertebra are unilateral or bilateral sacralization of the transverse process with or without foramina, narrowing and upward pointing of the transverse processes, non-fusion of the laminae of the spinous processes, and variations in the articular facets. Belden discusses these variations at some length.

The technique used in the roentgen-ray examination of the fifth lumbar vertebra is described briefly with emphasis on the importance of having the patient as straight as possible and of centering the rays properly. To demonstrate the relation between the transverse processes and the iliac crests, the central ray should be directed upward at an angle of 45 degrees. In addition to the anteroposterior views taken either singly or stereoscopically on the Potter-Bucky diaphragm, direct lateral exposures should be made.

For accurate interpretation of the pathological changes, knowledge of the age and sex of the patient and of any postural abnormalities which may be present, is necessary. The disease processes that involve the fifth lumbar vertebra are practically the same as those that involve other portions of the spine. They include osteitis deformans, osteitis fibrosa cystica, osteomalacia, Pott's disease, osteomyelitis, osteo-arthritis, and malignancy. Pott's disease and osteomyelitis of the fifth lumbar vertebra are comparatively rare. Malignant disease may invade in the form of an osteoplastic or an osteoclastic process. Non-involvement of the adjacent intervertebral disks serves to differentiate it from other conditions. The most common disease of the fifth lumbar vertebra is osteo-arthritis.

Fractures, which are comparatively rare in this vertebra, are most apt to involve the transverse processes.

Injuries and diseases of the fifth lumbar vertebra are easily recognizable causes of low back pain, but in many cases with this symptom the fifth lumbar vertebra shows no definite changes to account for the pain. The author believes that one of the most common causes of low backache is spondylolisthesis.

In reviewing the theories as to the relationship of anomalies of the fifth lumbar vertebra to low back pain, he states that while there is evidence indicating an etiological relation of the former to the latter, the fact that such anomalies are frequently found in the absence of symptoms makes it impossible to draw definite conclusions from the roentgen-ray findings.

The article includes numerous roentgenograms showing the various conditions described and is supplemented by a bibliography of 244 references.

ADOLPH HARTUNG, M.D.

Buckley, C. W.: Spondylitis Deformans. *Brit. M. J.*, 1931, 1, 1108.

Of 150 cases of spondylitis treated at the Devonshire Hospital, Buxton, England, during the last three years, 60 were cases of spondylitis ankylopoietica. Six of the patients with the latter condition were women.

Although spondylitis is usually attributed by the patient to an injury, the direct cause is undoubtedly an infection. The infections more often responsible are gonorrhoea, pyorrhoea, and tonsillitis.

Roentgen-ray examination usually shows osteoporosis of the vertebral bodies and often of the ilia and sacrum. The affected vertebrae are sensitive to pressure on the spinous processes, and there are root pains following the course of one or both sciatic nerves. Ossification of the interspinous ligaments, ligamenta subflava, and the joint capsules rapidly ensues and results in ankylosis. Frequently there is involvement of the costovertebral joints with consequent ankylosis requiring abdominal respiration. The sacro-iliac and hip joints may become completely ankylosed. The atlanto-axial joint, the small joints, and the joints below the hips usually escape.

Among the cases reviewed there were 61 cases of spondylitis osteo-arthritis. Two of the patients with this condition were women. The causes of osteo-arthritis spondylitis are the stress and strain of heavy labor. Roentgen-ray examination demonstrates changes varying from slight lipping to large exostoses which in some cases completely bridge the adjacent vertebrae. The symptoms are pain in the affected region of gradual onset or of sudden onset following a strain. Toxic and infective influences play an important rôle in the development of the condition. In the author's opinion, syphilis is also a cause.

Healed or quiescent tuberculosis of the vertebrae may present an appearance which is easily confused with that of other forms of spondylitis.

Kuermell's disease, which Kuermell called "spondylitis traumatica," is characterized by the breaking down of the cancellous tissue of the body of an injured vertebra. This breaking down results in recurrence of the pain and stiffness and the development of a slight kyphosis some time after the original symptoms caused by the injury.

RUDOLPH S. REICH, M.D.

Kisch, E., and Berger, H.: Tuberculous Spondylitis—Its Clinical Symptoms and the Results of Its Treatment with Sunlight and Fresh Air (Spondylitis tuberculosa—ihre klinischen Symptome und Heilergebnisse bei der Sonnen-Freiluftbehandlung). *Strahlentherapie*, 1931, xxxix, 109.

The treatment of tuberculosis of the bones and joints has undergone marked changes. From the exclusively surgical treatment, in which the attempt was made to remove the disease focus entirely, but recurrence was not prevented, some have gone over to conservative therapy. However, this extreme change has not been made in the treatment of tuberculosis of the spine. In the latter condition, treatment with sunlight and fresh air has always been regarded as of prime importance. It has been assumed erroneously that heliotherapy owes its effect to a specific action on the tuberculous process. The sunlight acts as a stimulant to the body, thereby increasing resistance.

Next to general treatment with sunlight, continued immobilization of the diseased parts is the most important factor. Corsets, even the Hessian corset, are insufficient for complete immobilization. Complete immobilization is possible only with rest in bed. In order that the rest in bed may not necessitate a continued stay indoors, the authors have their patients taken out to the balconies of the hospital.

In addition to complete immobilization by continued rest in bed, the diseased spinal column requires a uniformly hard substratum in order that the softened vertebral bodies may not protrude into the soft bedding. Therefore the authors recommend resting the spine on a pillow which is tightly filled with straw and further stiffened by a thin wooden board applied to the underside. In cases with gibbus formation a second pillow should be interposed and filled gradually to correct the gibbus. Pillows should be placed on both sides to support the arms. Involvement of the cervical part of the spine or paralysis requires continuous spinal extension.

During the exposure to sunlight in the authors' cases the patient lies on his abdomen with a pillow under the chest to extend the spine. The frequently occurring abscesses are punctured, the needle being inserted subcutaneously above the upper border of the abscess and then pushed in flat between the skin and abscess until it reaches the center of the abscess when it is made to perforate the abscess membrane vertically. By this kinking of the puncture canal, the danger of the formation of fistulae is reduced.

Tuberculous spondylitis may be considered healed only when the previously diseased vertebral bodies are insensitive to direct and indirect percussion, the rigidity of the diseased portion of the spine has entirely disappeared, the fistulae have cicatrized, and the nervous disturbances have subsided. After healing has occurred the authors' patients wore a corset of the Hessian type for three or four months.

The article presents statistical data based on 563 cases. In the cured cases the average duration of the treatment was thirteen months.

SILBERBERG (Z).

Pétrignani, R.: Pellegrini-Stieda Disease (La maladie de Pellegrini-Stieda). *Rev. d'orthop.*, 1931, xxviii, 105.

Pellegrini-Stieda disease is characterized by the presence of a bony new formation in relation to the internal condyle of the femur. The condition was first described by Pellegrini in 1905. Stieda in 1907 increased our knowledge of it, and Michelson reported cases.

The author believes that the disease is always of traumatic origin. It is found most frequently in men between the ages of twenty-five and forty years. It does not occur in children, and develops in women only rarely.

Following a blow over the internal condyle or a violent strain on the ligaments about the internal condyle, the patient complains of severe pain and often of considerable limitation of movement of the joint. There may be swelling about the internal condyle and at times there may be evidences of a hematoma in the subcutaneous tissues. Hydrarthrosis and hamarthrosis are rare. The absence of abnormal movements of the knee joint differentiates the condition from fracture. The continued pain and limitation of motion usually lead to repeated roentgen examinations. Evidences of a bony nucleus adjacent to the internal condyle of the femur is rarely visible until several weeks have elapsed. The shadow is usually in relation to the femorocondylar angle, occasionally in relation to the adductor magnus muscle and more rarely in relation to the inner aspect of the femoral condyle without extending beyond the joint space. The bony nucleus varies from 1 to 3 cm. in length and from 1 to 10 mm. in thickness. Successive roentgen examinations occasionally show a partial regression in the size of the calcified part.

Physical examination rarely discloses atrophy of the adjoining muscle groups. Hypertrophy of the internal condyle is common. Limitation of motion of the knee joint is very common. Flexion past a right angle is difficult, but there is never any interference with extension. Tenderness may be noted over the femorocondylar angle.

As the femoral condyle is devoid of periosteum where the tendons are inserted, the author rejects the theory that the bony nucleus is due to tearing up of periosteum. In some cases, however, there may have been a tearing up of bone with the adjoining periosteum. In cases in which the bony nuclei occur at sites not explained by such a cause, calcification may have occurred in an old hematoma or in torn fibrous or ligamentous tissues.

Pellegrini-Stieda disease must be differentiated from a fracture about the internal condyle of the femur, epicondylitis, and severe ligamentous strain.

The treatment is immobilization for ten to fifteen days followed by mild active motion. Massage is contra-indicated. At a later stage the application of heat may be beneficial. Roentgen therapy has been suggested to prevent ossification in traumatized areas or to cause regression of the

process. Surgery is indicated for the removal of large irregular bony nuclei and for cases in which the symptoms persist after conservative treatment. Operation should not be done while the ossification is still going on. **WILLIAM P. VAN WAGENEN, M.D.**

Haggart, G. E.: The Significance of Contracted Calf Muscles in the Mechanics of Foot Strain. *Surg. Clin. North Am.*, 1931, ii, 371.

The contracted heel cord, by limiting dorsal flexion in walking, causes abduction and pronation and finally flat-foot. The patient either abruptly lifts the heel from the ground at each step or, more often, throws the front of the foot outward, finishing the step over the inner border of the foot and eliminating toe action completely. The line of the body weight then falls to the inner side of the great toe and heel instead of between the first and second toes as under normal conditions. The patient has the feeling that more of his foot should be on the ground. Consequently he abducts and pronates the entire foot. This causes unusual strain on the ligaments supporting the longitudinal arch, these ligaments become weak and stretched, and thus a vicious circle is established.

The chief causes of the condition are contracted calf muscles, the wearing of improper shoes, a rapid increase in the body weight, and trauma.

Contracted calf muscles or, as Hibbs calls the condition, "muscle-bound foot," may result from the wearing of shoes with heels that are too high or from improper habits of walking, such as walking with the foot abducted. Some degree of contraction of the calf muscles is found in the majority of foot disorders, and in the treatment this should be the first condition considered for correction.

WILLIAM ARTHUR CLARK, M.D.

Burman, M. S., and Lapidus, P. W.: The Functional Disturbances Caused by the Inconstant Bones and Sesamoids of the Foot. *Arch. Surg.*, 1931, xxii, 936.

The inconstant bones and sesamoids considered by the authors are the os trigonum, accessory scaphoid or os tibiale externum, os peroneum, styloid epiphysis and os vesalianum, os intermetatarsum, calcaneus secundarius (and calcaneonavicular fusion), os supranaviculare, secondary astragalus, or paracuneiforme, os subtibiale, bipartite internal cuneiform, bipartite cuboid, os proprium sustentaculi, cuboides secundarius, os unci, constant sesamoids of the great toe, and inconstant sesamoids of the other toes.

The authors prefer to call these ossicles "inconstant bones" instead of "accessory bones" as almost every one of them has a separate cartilaginous center formed as early as the second or third month of fetal life. They discuss each inconstant bone in detail.

In conclusion they state that functional changes due to the inconstant bones of the foot and the sesamoids are not numerous, but become of im-

portance from the standpoint of compensation because about 75 per cent of feet present such anomalies. The inconstant bones seldom disturb the statics of the foot. H. EARLE CONWELL, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Grantham, S. A.: A Tunneling Method of Spinal Fixation. *Am. J. Surg.*, 1931, xii, 448.

The procedure described in this article was devised by the author with the idea of sparing as much as possible the ligaments, fasciæ, and muscles attached to the spine which are of special importance as supporting structures in the presence of spinal disease.

A transverse incision from $1\frac{1}{2}$ to 2 in. in length is made through the skin, subcutaneous tissue, fascia, and supraspinous ligament caudad to the second spinous process below the affected vertebra.

By means of tunneling osteotomes devised by the author, the spinous processes are sectioned at their attachments to the laminae and the desired number are removed. A flanged retractor is then introduced to provide an adequate channel for placement of the graft. After the introduction of the graft the wound is closed and the graft is held in position by the structures over it. The patient may move about in bed without danger and may be allowed out of bed after a few weeks.

In cases of angulation deformity, 2 spinous processes are sectioned above and below the kyphos and a section of rib is used for the graft.

In the 100 cases in which this operation has been performed there were 3 deaths. The method is of advantage because it requires only slight exposure of the spine, it causes minimal trauma to essential structures, there is no surgical shock, the graft is fixed without retention sutures, and a cast or brace is unnecessary. RUDOLPH S. REICH, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Clute, H. M.: **Idiopathic Thrombosis of the Axillary Vein.** *Surg. Clin. North Am.*, 1931, ii, 253.

The author reports two cases of idiopathic thrombosis of the axillary vein. The patients were women twenty-one and forty-two years of age. In both cases the traumatic factor was apparently sudden abduction and external rotation.

The significant features in these two cases were the same as those noted in all cases previously reported.

Pain occurs only after the thrombosis has developed. The edema and congestion of the upper extremity are accompanied by the symptoms of muscle fatigue. In no case has fever been noted.

Cases reported in the literature and the author's two cases show that the disability arising from this lesion ultimately disappears. Its duration depends upon the length of time that elapses before a collateral venous circulation is established.

The treatment of axillary thrombosis is essentially the management of the local difficulties. The arm should be supported in an elevated position. At the end of a month the thrombosed area is usually organized. Massage and active motion are then indicated.

The pressure effect of the costocoracoid ligament and the subclavius muscle on the axillary vein was shown by the anatomical findings of Lowenstein and studies carried out by Gould and Patey in which plaster of Paris was injected into the axillary vein of cadavers. These investigators are of the opinion that the trauma to the intima of the axillary vein is produced by the costocoracoid membrane and the subclavius muscle on the distended axillary vein during marked abduction or extension of the arm, especially when these movements are combined with external rotation. J. EDWIN KIRKPATRICK, M.D.

Mandl, F.: **Thrombophlebitis, Operation, Embolism, Attempted Trendelenburg Operation (Thrombophlebitis, Operation, Embolie, Versuch einer Trendelenburgschen Operation).** *Zentralbl. f. Chir.*, 1931, p. 86.

Under anaesthesia and by the method of Buedinger with small sharp dissections, Mandl freed and removed a thrombus about 5 cm. long from the left leg of a forty-two-year-old obese woman. Then, as a precaution, he ligated the saphenous vein where it joined the femoral vein. Seven days later the patient was allowed to get up. On the eighth day embolism occurred. A Trendelenburg operation was then done. During the extraction of the embolus, the heart ceased beating for five minutes. After removal of the embolus, which was in the right pulmonary artery, 16 cm. long and 3 cm. thick, the

beating of the heart was restored, but a few minutes later it stopped again and all further efforts at resuscitation were unsuccessful.

The author believes the thrombus came from the large vessels despite the fact that these vessels were found free from thrombi at autopsy. He regrets that he ligated the saphenous vein as a "precautionary measure."

MAX BUDER (Z).

Cattell, R. B.: **The Treatment of Varicose Ulcer.** *Surg. Clin. North Am.*, 1931, ii, 291.

The author describes a combined ambulatory treatment for varicose ulcer which consists of obliteration of the associated veins by the local use of a sclerosing solution together with a tissue coagulant and the application of an elastic bandage support. The chief contra-indication is true phlebitis. Other contra-indications are advanced arteriosclerosis and severe chronic nephritis.

The injections are made with a 2-c.cm. syringe and a fine-gauge needle. A quinine hydrochloride and urethane solution is preferred as this is effective in smaller quantities than other solutions. For small veins from $\frac{1}{8}$ to 1 c.cm. is often sufficient. This should be the initial dose. The total amount should not exceed 6 c.cm. The veins entering and leaving the ulcer should be injected first. An additional bit of technique called "fanning" is described. This consists in exploring the tissue beneath the ulcer bed while maintaining a negative pressure in the syringe until a communicating vein is entered. The injection is not made until a free back-flow of blood is seen in the syringe while the negative pressure is maintained. The solution must be injected into a vein lumen, and must not be spread about beneath the bed of the ulcer.

The supportive measures are important. At the first visit, mechanical cleansing of the ulcer is done. Greasy substances are removed with ether. After the injection, the ulcer is covered with a gauze dressing built up to conform to its outline and well saturated with a 5 per cent aqueous solution of tannic acid. Over this dressing an elastic bandage is applied immediately for support. When the ulcer is associated with considerable swelling of the leg, the "Klebro" bandage is of value. This may be worn as long as three weeks without shifting its position, and may be used during the initial period to reduce the swelling. When the injections are begun, the elastic bandage is more convenient and satisfactory. The patient re-applies and tightens the elastic bandage two or three times a day and saturates the dressing with tannic acid solution before the bandage is replaced. The entire area of the ulcer becomes covered by a thick black membrane under which the epithelium grows. Infected

material should not be allowed to accumulate beneath the eschar.

Exercises with the Buerger board are sometimes prescribed to improve the general circulation in the extremity. After the ulcer is healed and all tenderness has disappeared from the veins, the patient is directed to rub a small amount of lanolin into the skin to make it soft and pliable.

The results of this combined treatment are usually satisfactory. While in two cases reported by the author the ulcer recurred following a local injury, it was healed by a repetition of the treatment. However, in one case of long-standing ulcer which had been completely healed for several weeks the result was poor, as following a minor injury the entire area broke down again. Cattell concludes that there is always a tendency toward the recurrence of an ulcer following an injury or the possible re-formation of the veins.

J. EDWIN KIRKPATRICK, M.D.

McPheeters, H. D., and Merker, C. E.: *Varicose Ulcers; Treatment with the "Rubber Sponge or Venous Heart" and a Supportive Bandage.* *Surg., Gynec. & Obst.*, 1931, lii, 1164.

Varicose ulcers may be classified into three groups: (1) those which respond to treatment and heal readily, (2) those in which healing is prevented by low vitality of the tissues and scar-tissue formation, and (3) those due to lymphatic blockage following repeated attacks of thrombophlebitis.

The only justifiable method of treatment today is the injection treatment, but destruction of the reflux venous flow alone is not sufficient to produce healing, particularly in cases belonging to Groups 2 and 3. The authors have obtained good results by compressing and supporting the tissues after the injections with a rubber sponge held in place with an Ace bandage.

For the treatment of a varicose ulcer with rubber-sponge compression they give the following rules:

1. Cleanse the skin and ulcer area with gauze wet with benzine.
 2. Apply 10 per cent silver nitrate to the ulcer. This stimulates, but is of no value at the first dressing of a badly infected and necrotic ulcer.
 3. Apply to the ulcer area a mild ointment that will remain soft. Many ointments dry and cake.
 4. Apply several layers of fluffed gauze.
 5. Cover this with four layers of sheet wadding or cellulocotton.
 6. Use a rubber bath sponge of a good grade (the firmest possible), that is 1 in. larger than the ulcerating area.
 7. Bandage this all in place with a 3-in. plain gauze bandage. Be very careful that the dressing and sponge do not slip to one side.
 8. Apply a 4-in. Ace bandage from just below the knee to the toes over the sponge and dressing. Bandage firmly. The more cellulitis that is present and the worse the ulceration, the tighter the bandage must be applied. Apply it as a double figure of eight about the foot and ankle.
 9. Inform the patient that the more he walks with the leg thus bandaged, the quicker the ulcer will heal.
 10. Never apply the sponge and bandage described to a bed patient.
 11. Change the dressings often enough to keep them from becoming saturated. As a rule it is best to change them every two days. When soiled, the rubber sponge can be boiled up and used again, but it should be discarded as soon as it becomes firmly pressed together.
- After the sponge has been bound in place very tightly, the patient will suffer great pain unless he moves about, but if he walks a great deal the soreness will rapidly disappear.

WILLIAM E. SHACKLETON, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

John, H. J.: Surgery in the Presence of Diabetes.
J. Lab. & Clin. Med., 1931, xvi, 775.

Since the use of insulin, the mortality of surgery in the presence of diabetes has been greatly reduced. John divides cases of diabetes requiring surgery into non-emergency and emergency cases and discusses the management of each type. The dosage of insulin, the diet, and the intravenous administration of saline solution and glucose are discussed in detail. The pre-operative treatment of the surgical diabetic is exactly the same as that of the ordinary diabetic. Several cases are reported.

If any infection is present, a blood culture should be made before operation. If bacteremia is found, death following operation will not be a surgical death. A second blood culture should be made from twenty-four to forty-eight hours after the operation in order to ascertain whether bacteremia has developed. This measure protects both the surgeon and the physician and aids in making the prognosis.

After the operation, the oxygen tent should be used in cases in which there is any degree of anoxemia. It should be employed before the patient becomes definitely cyanotic. The clinical signs of anoxemia are excitability, headache, a rapid pulse, and a dusky appearance of the nails. The use of the oxygen tent should be explained to the patient in order to secure his cooperation.

CARL R. STEINKE, M.D.

Koenig, W.: New Viewpoints on the Origin of Thrombosis (Neue Gesichtspunkte zur Entstehung der Thrombose). *Zentralbl. f. Chir.*, 1931, p. 130.

Up to the present time no method had been devised for the experimental study of the three chief factors concerned in the development of thrombosis, viz., a circulatory disturbance, injury to the wall of a blood vessel, and a change in the blood. The surgeon seeks the cause of the injury in the operative procedure. Koenig attributes the injury to a simple toxin, the so-called "early toxin" of Freund, which he has found in disintegrated muscle. This toxin must be present after every operation in which tissue is destroyed. The change in the distribution of the blood following the formation of the early toxin, particularly the vascular dilatation in the lower extremities, is an important factor in the development of thrombosis. It has been shown by Ipsen, among others, that the temperature of the soles of the feet increases 4 or 5 degrees after operations, whereas the temperature of the rest of the body remains unchanged. This increase in the temperature of the sole of the foot has some relationship to the plantar venous system,

in which Payr has frequently found the first indications of impending thrombosis. With regard to the effect of the early toxin on the blood vessels, the author refers to the literature.

In his own studies, Koenig investigated the toxic effect of disintegrated muscle tissue on the blood platelets. He found that the number of thrombocytes decreased markedly and later increased above the normal just as after operation. He believes that the chemical changes in the blood must be attributed to the same toxic effect. The active principle of this material must be formed by the destruction of the muscle. Therefore it must be a product of lysis of the nuclear substance just as the early toxins which Zipf obtained from defibrinated blood are nucleotides. Koenig noted the same changes in the platelets following the injection of adenosin as following the injection of expressed muscle juice. He calls attention to the fact that thrombosis is most frequent in conditions accompanied by an especially pronounced nuclear destruction and in cases of tumor, inflammation, and fracture.

In regard to therapy, Koenig states that the disintegration of the thrombocytes—and with it possibly a number of other "symptoms"—may be prevented. This is possible with autogenous blood, by which the changes in the platelets following operation and following the injection of expressed muscle juices may be prevented. "Prophylaxis and therapy of thrombosis must be directed toward detoxifying or preventing the occurrence of the substance which is the immediate cause of the thrombosis."

W. KOENIG (Z).

Nordmann: Thrombosis and Embolism (Thrombose und Embolie). *Zentralbl. f. Chir.*, 1930, pp. 362, 3973.

Of 30,000 patients treated in the period from 1909 to 1929, 1.27 per cent developed thrombosis and embolism and 0.6 per cent died of embolism. Of 17,060 patients subjected to a major operation, 0.8 per cent (77 men and 64 women) died of embolism. Forty-one men and 37 women were cured of serious embolism by conservative treatment. Of the 350 patients (2.2 per cent) who developed thrombosis after an operation, 50 per cent died, 20 per cent survived a serious embolism, and 30 per cent did not develop embolism. The incidence of thrombosis and embolism was twice as high in surgically treated cases as in cases of surgical diseases not operated upon. Of the cases of fracture, nearly all of which were treated conservatively, thrombosis or embolism developed in 2.3 per cent, and of the cases of embolism following fracture, 1.4 per cent were fatal.

In the year 1924 the incidence of thrombosis and embolism increased from 2 to 3 per cent, and in 1927

it increased to 4.5 per cent. In 1928 and 1929 it decreased to 3.3 per cent, but there was an increase of fatal embolism to 1.9 per cent. Thrombosis and embolism are especially frequent after gynecological and gastric operations. In cases of hernia their incidence is nearly 3 per cent. In autopsy material of hospitals in the period from 1907 to 1929 it was found that the incidence of embolism as the cause of death increased in 1924 to 5 per cent, and in 1925, 1926, and 1927 to about 7 per cent. Similar increases were shown by the autopsy material from the internal medical service.

Today thrombosis occurs even in persons under twenty years of age. In advanced age, thrombosis is very dangerous, fatal embolism occurring in 80 per cent of the cases. The increase of thrombosis is associated with an increase in postoperative pulmonary disturbances. The condition is probably due to a specific infection. Surgical infection, constitutional factors, anesthesia, and intravenous injections play no rôle. Prophylactic measures have been of no avail. In the treatment of cases of thrombosis, prolonged fixation with a splint should be avoided. If possible, the patient should be allowed to sit up with the leg bandaged.

The treatment of embolism includes the administration of oxygen and morphine. As definite indications are impossible surgical intervention is of doubtful value, but operation may be attempted in the cases of moribund patients as in such cases nothing is to be lost thereby.

In the discussion of this report, HUEBSCHMANN warned against the indiscriminate use of intravenous injections and continuous infusion, citing statistics published by Schleussing which demonstrated a parallelism between these procedures and the occurrence of embolism. He stated that while in some cases thrombosis occurring after continuous infusion in the superficial veins may be symptomless and even harmless as regards the formation of emboli because emboli coming from superficial veins are tolerated by the lungs, in others it may be fatal. A man sixty-three years old who was given a continuous infusion in the left ulnar vein following a gastric operation died the next day with brain symptoms. Autopsy demonstrated a thrombosis of the left ulnar vein, a small and symptomless embolus of a middle pulmonary artery, an open foramen ovale and a formless embolus in the median cerebral artery on the right side.

LAVEN stated that he had often known thrombosis of the basilic vein to develop after continuous intravenous infusion, and that the incidence of this complication can be decreased by preventing movement of the cannula of inflow.

KROEGER reported that from the records of the Koenigsberg clinic for the period from 1918 to 1929, she had collected 192 cases of thrombosis or emboli following operation or delivery. In this period the incidence of postoperative thromboses and emboli increased 10 times, the incidence of postoperative thrombosis 13 times, the incidence of postoperative

emboli 7 times, and the incidence of thrombosis after delivery 3 times. She was unable to explain the increases.

PUPPEL reported that of 10,315 deliveries at the Hessian Training School for Midwives in the period from 1919 to 1929, thrombosis occurred in 172 (1.67 per cent), with 16 emboli and 7 deaths. Of 15 cases of embolism in which there was 1 death no thrombosis was apparent. Three patients died of septic thrombophlebitis. Nine of 11 cases occurred in the first four years following the war, 1 in 1926, and 1 in 1929. Multiparæ are in much more danger than primiparæ. Embolism shows a marked increase at about the eleventh day. In 42 per cent of the cases varices were present during pregnancy. In 2,831 gynecological cases there were 30 cases of thrombosis. In 28, the condition followed operation, and in 2, conservative treatment. In 1927, the incidence of embolism increased about 2½ times. Among the causes of obstetrical deaths, thrombo-embolism ranks with heart failure, sepsis, and hæmorrhage, its mortality being 13.6 per cent. The most frequent cause of death is peritonitis, the mortality of which is 27.2 per cent. On the gynecological service there were 2 cases of embolism and 1 case of fatal thrombosis, the incidence of these conditions being therefore 5.7 per cent. In gynecological diseases also, peritonitis, sepsis, and heart failure are the chief causes of death. Prophylaxis has resulted in no recognizable improvement. The patient should be turned in bed after the third or fourth day, and should not be allowed to get out of bed too early. Thrombosis should be treated with mustard and alcohol compresses, hot air "douches," and compression bandages.

FREY stated that he is very sceptical regarding prophylactic treatment with calcium. Of 100 patients treated with calcium, 2 developed fatal emboli after appendectomy.

MICHAELIS emphasized the importance of a subfebrile temperature as a prodromal phenomenon of thrombosis.

HENKE called attention to the fact that otorhinological surgeons never see cases of acute fatal pulmonary embolism although they often see thrombus formation in the great brain sinuses. After craniotomy, acute fatal pulmonary embolism is very rare.

WORTMANN (2).

Bodon, G.: The Increase of Fatal Pulmonary Embolism (Ueber die Vermehrung der toedlichen Lungenembolien). *Orrovi heil.*, 1931, 1, 29.

The great variation in embolus statistics is due in large part to faulty compilation. Only the findings of autopsies on persons over fifteen years of age should be included. The number of autopsies performed on subjects of different ages and of each sex and the number of cases of embolism coming from medical, surgical, and obstetrical services should be recorded.

According to the author's statistics, the incidence of embolism has been four times as high since the

war as it was in the period from 1911 to 1913. Emboli are now more common in women than formerly, but their increase in men has been relatively higher. They occur more frequently in surgical cases than in non-surgical cases. The number of obstetrical emboli is insignificant. The incidence of emboli in surgical cases has increased four times in relation to the number of autopsies and two and a half times in relation to the number of operations. The embolism appears from one to fifteen days after the operation, especially after operations on the abdomen and operations on obese patients.

In non-surgical conditions the incidence of emboli has doubled. In these conditions they are nearly always associated with diseases of the circulatory system such as occur most frequently in persons with moderate or poor nutrition. The incidence of diseases of the circulatory system associated with congestion is today twice as high as in the period from 1911 to 1913. The increase corresponds to that in the incidence of emboli in non-surgical conditions. The author therefore attributes the increase in the incidence of emboli in non-surgical conditions to the increase in diseases of the circulatory system. He rejects influenza, intravenous injections, and infection as causes. He attributes surgical emboli to circulatory disturbances dependent upon weakness of the diaphragm and abdominal musculature, but believes that constitutional factors and a change in the blood after operations play an important rôle.

FISCHMANN (Z.).

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Veyrassat, J.: Considerations on the Conservative Treatment of Grave Wounds of the Fingers (Quelques considérations sur le traitement conservateur des plaies graves des doigts). *Rev. méd. de la Suisse Rom.*, 1931, li, 193.

This article is based on wounds and infections of the fingers seen over a period of twenty years. The author emphasizes that in the conservative treatment of such conditions the primary consideration should be the preservation of function, preservation of anatomical form being of secondary importance. He calls attention to the fact that most infections of digits follow slight wounds rather than severe lacerations. He attributes the relatively high resistance of the fingers to infection to their lack of muscles to furnish a culture medium for the growth of bacteria and to the rich blood supply of their tendons and subcutaneous tissues. He does not fear the opening of joint cavities as he believes that these cavities are lined with cartilaginous tissue which is conditioned and smoothed by the tangential friction. He is of the opinion also that this lining rather than the serous tissue is responsible for the slowness with which joint collections are absorbed and that it acts as a barrier against bacterial invasion. He regards the joint fluid as altered and liquefied. He believes that the tendon sheaths are also lined with connec-

tive tissue rather than endothelium, that they are smoothed by the motion of the tendons, and that they resist infection well.

The successful conservative treatment devised for wounds of other regions of the body during the war is applicable to wounds of the fingers. The author disapproves of the use of chemical antiseptics such as phenol, hydrogen peroxide, Dakin's solution, and iodine as he believes they cause further injury to traumatized tissues. For contaminated wounds he recommends irrigation of the injured member with large amounts of physiological salt solution at a temperature of 45 degrees C and under slight pressure, followed by the application of sterile dressings, immobilization, and the administration of anti-tetanus serum. For clean injuries of a finger tip he recommends immediate suture followed by conservative measures. He advocates a trial of conservative treatment in all cases despite the length of time it consumes, its cost, and the possibility that it may fail for if gangrene, infection, ankylosis, or a cicatrix destroying all hope of function develop, amputation can be done later.

JAMES B. MASON, M.D.

Suransa, S.: The Treatment of Tetanus by Intrathecal Injection of Carbolic Acid. *Lancet*, 1931, ccxx, 1075.

The author believes that carbolic acid given intrathecally is a specific remedy against tetanus. Of fourteen cases in which it was used, death occurred only in four and in these four the final stages of cardiac and respiratory failure had been reached. Recovery in the ten other cases was very evidently due to the carbolic treatment as the condition was not of the mild variety in which spontaneous recovery is possible.

Adults are given from 30 to 40 c.cm., and children, from 12 to 20 c.cm., of a 1:400 solution of carbolic acid in normal saline solution. The dose is varied according to the severity of the condition.

Rigidity of the muscles of the back often results from irritation of the motor nerve roots from the first to the seventh day of the injection. The decrease or disappearance of lockjaw is an indication of amelioration, but it is possible that the carbolic acid may cause lockjaw by irritating the fifth cranial nerve, under which circumstances the seventh nerve will be stimulated simultaneously.

A rash varying in intensity and character appears between the first and seventh days and lasts for from four to fourteen days. It abates without treatment and should cause no anxiety. It is probably due to elimination of the carbolic acid by way of the skin.

In a few of the cases reviewed acute nephritis was present. This was doubtless due to elimination of the carbolic acid through the kidneys. The carbolic acid treatment is therefore contra-indicated in the cases of patients with chronic renal disease, especially old persons with impairment of the kidneys.

Carbolic acid is preferable to serum because it is more certain in its action, it is effective when in-

jected only once, its cost is almost nil. Its only disadvantage is the danger associated with its use in chronic kidney disease. SAMUEL KAHN, M.D.

ANÆSTHESIA

Nicolosi, G.: The Glycogenic Function of the Liver Under Ether and Chloroform Anæsthesia (Sulla funzione glicogenetica del fegato nell'anestesia eterea e cloroformica). *Clin. chir.*, 1931, vii, 277.

The author studied the glycogenic function of the liver, recording the changes in the sugar content of the blood in the femoral artery and vein, the portal vein, and suprahepatic vein after chloroform and ether anæsthesia. The results were almost the same for the two anæsthetics. They showed that anæsthesia increases the blood sugar throughout the peripheral circulation, but decreases it in the suprahepatic vein. Nicolosi concludes that the liver does not participate in the increase of blood sugar caused by anæsthesia. AUDREY G. MORGAN, M.D.

Scheitz, L.: The Present Status of Local Anæsthesia (Ueber den heutigen Stand der Lokalanæsthesie). *Verhandl. d. 16 Tag. d. ungar. Gesellsch. f. Chir.*, 1930, p. 10.

The purpose for which the newer anæsthetic agents are employed is an increase and prolongation of the anæsthesia. Anæsthetics with this effect have an increased toxicity, but as the anæsthetic action of most of them is almost twice their toxic action, much smaller doses are sufficient and it is therefore unnecessary to consider the increased toxicity.

In the preparation of the anæsthetic solution it is necessary to bear in mind the importance of: (1) reducing the dosage and thereby the toxic effect of the anæsthetic, and (2) controlling the tissue damage and pain produced by the injection. These ends are attained with the use of freshly prepared isotonic buffer solutions with the alkalinity of blood which are combined with adrenalin and heated to body temperature.

Local anæsthesia is used most satisfactorily for operations on the head although in the head its sequelæ are most frequent. Unfavorable sequelæ are associated most commonly with anæsthetizing procedures in the oral and ocular cavities, and occur least often after those on the skin. Therefore the induction of anæsthesia through the mouth and eye cavities must be avoided even when its recognized contra-indications (tumor, inflammation) are absent.

Cervical injection for anæsthesia of the anterior half of the neck should be avoided if possible because of its dangers, even though in some cases it has proved of value. The blocking injection along the posterior margin of the sternocleidomastoid muscle is certain and free from danger. A circumferential injection may be undertaken safely only if the disease has not too greatly altered the anatomical relationships.

Anæsthesia of the chest wall and vertebral column is produced by block and circumferential

injection of the nerves coursing about the vertebrae and the intercostal nerves. All of these nerves run in areas bounded by bone; therefore they can be found easily and anæsthetized quickly. The anæsthetization of the chest organs, however, is incomplete. Therefore in major operations on these structures it is necessary to resort to general anæsthesia.

For anæsthetization of the abdominal wall, nerve-blocking methods have not been generally adopted because, in addition to the time-consuming unilateral or bilateral injection, an injection within the abdominal cavity is required. Circumferential injection produces anæsthesia sooner.

Within the abdominal cavity both the infiltration and the blocking methods have been found of value. They have reduced the mortality of major abdominal operations. However, their application is limited because the blocking methods (with the exception of the Kappis procedure) can be used only for operations based upon an exact diagnosis, in which the site of operation and the organ to be operated upon are known beforehand. In cases in which we are compelled to operate on the basis of a general diagnosis such as peritonitis, ileus, or gunshot wound of the abdomen, they cannot be employed. Moreover, some of them (Braun's splanchnic block) are contra-indicated in peritonitis. The infiltration method will not permit painless exploration of the abdominal cavity. Unfortunately, therefore, none of these procedures is satisfactory in the cases in which, because of severe, acute disease of the abdomen, it is most important to prevent the injurious consequences of general anæsthesia.

With regard to the local anæsthetic procedures employed in other cases, the author cites the remark of Gutierrez: "A correct diagnosis and much, very much, patience are important."

The plexus anæsthesia for the upper extremity is dangerous and uncertain. In a review of 1,000 cases reported in the literature, Napalkow found that temporary paralysis resulted in 8 and permanent paralysis in 7. Unfavorable sequelæ cannot be avoided with certainty even with a correct technique. It is therefore recommended that this method be used only in cases in which other methods (segmental circumferential injections of the extremity) are inadequate or inapplicable. For operations on the lower extremities which are limited to a circumscribed region the circumferential injection anæsthesia is preferable to the tedious conduction anæsthesia. When circumferential injection anæsthesia is impossible, the author prefers conduction or spinal anæsthesia.

For anæsthetization of the entire abdominal cavity the paravertebral method has lost its standing because of its tediousness and delicacy and the large quantity of anæsthetic solution it requires. It is now used more for the anæsthetization of individual organs. The effort is being made to reduce the number of regions anæsthetized and the quantity of solution used. Nevertheless the procedure is associated with slight danger.

The parasacral and epidural procedures are valuable and without danger when it is possible to enter the sacral canal easily and avoid injury to adjacent structures and when a minimal amount of solution is used.

Spinal anaesthesia has recently again found extensive application. The puncture is made with a fine needle and ephedrin is given prophylactically. The use of spinocain widens the indications. The author cites 127 cases in which operation was performed successfully under spinocain anaesthesia. The conditions treated included stomach and gall-bladder diseases, acute pancreatitis, and ileus. The simplicity and certainty of spinal anaesthesia justify its use. When spinocain is employed the anaesthesia must not be carried above the costal arch; spinal anaesthesia induced with aqueous anaesthetic solutions above the level of the umbilicus is dangerous. Spinal anaesthesia is especially indicated in ileus as it favors the resumption of intestinal activity; when the blood pressure is below 100 mm. Hg (shock, hæmorrhage), caution is necessary.

The use of local anaesthesia in diagnosis and therapy has recently been increasing. Although this method is not of great importance in diagnosis, it has led to many valuable observations and experiences. It is partly responsible for the fact that paravertebral anaesthesia has again found wider application because the segments corresponding to the different organs are now more accurately recognized. The delicacy of the spinal and paravertebral procedures make a wider use of these methods in daily practice impossible. Because of it, they can be

employed only by specialists and in cases in which other antispasmodic and anaesthetic measures are inadequate.

Infiltration procedures are still new. Nevertheless we should consider them the precursors of morphine-free treatment. They are indicated especially in cases of chronic disease in which there is danger of morphine addiction.

Cocaine should be avoided. When it is used, veronal or luminal should be given prophylactically. In cases of poisoning from cocaine or a related anaesthetic agent, the intravenous injection of these preparations is indicated.

In the choice of the procedure for the induction of anaesthesia it is necessary to determine, first, which procedure is demanded by the patient's condition; second, which, from the viewpoint of the operation to be performed, will be the more advantageous to the patient; and third, which procedure the patient prefers. With the introduction of conduction anaesthesia, local anaesthesia began to lose that characteristic—its safety—which constitutes its chief indication. Some procedures are dangerous because of secondary injuries caused by penetration of the injected material to the point of toxicity into areas where it should not penetrate. Some are lacking in simplicity of technique. Others do not cause complete loss of sensation and must be supplemented by the blocking of another nerve or a trunk from another site. Except for a few methods, conduction anaesthesia has not yielded the results which were expected from it.

VON LOBMEYER (Z).

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Weber, H. M.: The Roentgenological Demonstration of Polypoid Lesions and Polyposis of the Large Intestine. *Am. J. Roentgenol.*, 1931, xxv, 577.

Almost all organic diseases of the large intestine produce deformity in the contours of the lumen of the affected segment. Because it furnishes a marked contrast and because of the reliability of the diagnostic data which it yields, the opaque enema has been the agent of choice for demonstration of the distinctive features of deformities produced by disease of the colon.

Polypoid lesions of the colon cannot be depended on to produce a roentgenologically demonstrable deformity in the lumen of the colon.

Weber has applied the "combined method" of Fischer, modified along the lines indicated, to the demonstration of polyps and polyposis of the colon. Diagnostic results have been gratifying. In the application of this technique it is essential that all residues and fecal remnants be entirely removed, and that the walls of the colon be collapsed. On the day before the examination, the evening meal is withheld and 2 oz. (60 c.c.) of castor oil are administered. On the following morning the distal parts of the colon and rectum are cleansed by one or two plain, low enemas. Saline purgatives, and cathartics which activate the bowel by irritation are avoided. The patient then presents himself at the roentgenological laboratory and the opaque enema is administered under roentgenoscopic control. The opaque material in the enema should be minutely divided and uniformly suspended, and the suspension should be well sustained. The consistency of the enema should approximate that of heavy cream.

The roentgenoscopic and roentgenographic study should be completed with dispatch as the opaque salt sometimes goes out of suspension rapidly, perhaps because of the dehydrating function of the colon.

The colon is inflated under roentgenoscopic control, with care not to overdistend any of the segments. The procedure is facilitated by frequent rotation of the patient on the roentgenoscopic table and by manipulating the bowel through the abdominal wall. In no case has insufflation carried out in this way caused any more distress than the administration of the opaque enema.

This combined method is not recommended at present as a routine procedure. As compared with the barium enema, it is cumbersome and relatively expensive and yields too little additional information in diseases which produce luminal deformity unless

it is specifically indicated. Weber has not been able, even with the combined method, to establish with certainty the presence of polyps much less than 1 cm. in diameter. He found the method valuable in roentgenological investigation of rarer conditions in which the colon presents some anomaly of development such as failure of descent and rotation, and in cases of marked redundancy in which roentgenoscopic examination proved indeterminate on account of the difficulty of manually disengaging the coils or the difficulty of simplifying the complex shadow of overlying loops by rotation and separation. On occasion, the method may be used for the roentgenographic demonstration of a colonic lesion which, though adequately visualized roentgenoscopically, is obscured in the roentgenogram by overlying loops filled with dense, opaque material.

Except in cases in which patients have been referred especially for determination of the presence of polypoid lesions, Weber has used the opaque enema first and has applied the combined method when the data yielded by the opaque enema were insufficiently precise to make possible a decision regarding the nature of the disease present. He has applied the combined method also in the presence of disease of the colon other than polypoid lesions and polyposis. Because of its novelty, he hesitates to render an estimate of the value of the combined method in the differential diagnosis of deforming diseases of the colon. However, he believes that with accumulation of experience and refinement in technique the combined method will make valuable contributions toward increased accuracy in the roentgenological differential diagnosis of all types of diseases of the colon.

Wood, F. C.: Short Wave-Length Irradiation. *J. Am. M. Ass.*, 1931, xcvi, 1753.

Exact measurement of roentgen rays is of importance primarily in therapy to prevent damage to the skin and to estimate the maximum effect on the tissues to be treated. The quantities of irradiation used in roentgenography are usually so small that there is little risk of damaging the skin unless the exposures are repeated too frequently. However, it is always wise, before making a roentgenogram, as well as before giving a treatment, to ask the patient whether he has recently had an X-ray exposure. In fluoroscopy also a rough approximation of the erythema dose should be known and the exposure of the patient and the operator should be the shortest exposure that will permit the necessary observations. The use of artificial light therapy, the application of certain substances to the skin, and the taking of certain medicines have sometimes seemed to sensitize the patient and cause injury to the skin by amounts

of irradiation that otherwise would have been harmless. Therefore it is well to make inquiries relative to these factors before applying roentgen rays for any purpose.

The roentgen rays used for therapy are of three types: (1) supersoft rays, which are roentgen rays generated at 10,000 volts or less, (2) ordinary therapy rays from 60,000 to about 150,000 volts, and (3) high-voltage therapy up to the present approximate limit of 200 kilovolts.

The supersoft rays are absorbed very largely in the superficial layers of the skin. Therefore the surface dose is the only factor of importance to be determined. Although pastilles or specially constructed ionization apparatus may be used to measure these rays, in most instances tubes are calibrated by experimental erythemas and exposures are made on the basis of constant factors thus determined.

With unfiltered irradiation at from 60,000 to 70,000 volts, an indirect method of measurement is widely employed. In the use of unfiltered dosage it must be borne in mind that the quantity of the X rays varies according to the square of the voltage, directly as the milliamperage and the time, and inversely as the square of the distance. The use of an exposure formula based on these facts requires a fairly accurate measurement of voltage and a carefully standardized millimeter. Formulae which have been worked out by Remer and Witherbee and by MacKee for an erythema dose have been found very satisfactory. Consideration must be given to the age and complexion of the patient and the location of the exposure since these have a bearing on the skin tolerance.

If filters are used, a fresh series of factors must be obtained, the erythema formula being different with each thickness of filter used. Dosage charts for varied filtrations for superficial therapy will be found in MacKee's book. Some dermatologists prefer to make direct observations of the dosage by the photographic method or the pastille method. The authors describe these methods briefly. The pastille method is satisfactory for dermatological practice, but does not give accurate enough measurements with highly filtered irradiation. In recent years it has been largely abandoned and replaced by some type of ionization chamber.

Measurement by the ionization method is discussed at some length with regard to the principles on which it is based, the standards used with it, and various types of apparatus employed. A considerable number of forms of commercial apparatus for measuring X-rays by ionization are available. These are expensive, easily damaged, and difficult to use. Most workers measure the output of their tubes under fixed conditions from time to time and then use the apparatus without changing the controls. It is evident that there is still room for the development of a simple, cheap, and accurate method of measuring the output of an X-ray tube.

The use of tumor cells or flies' eggs as a method of measuring roentgen rays is possible, but a certain

technical skill is required in handling these biological materials. However, in one radiotherapeutic clinic flies' eggs have been employed continuously for standardization purposes for several years. The flies' eggs can be used by the makers of apparatus to calibrate such apparatus in units as the procedure is somewhat simpler than, and nearly as accurate as, the elaborate set-up required to obtain accurate measurements with a standard ionization chamber.

It has been demonstrated that the death of the individual cell is independent of the wave length. The determination of the wave length becomes important only when the question of depth dose (penetration) arises. Because of secondary scattering in the tissues, the depth dose depends in part on the area of surface exposed. It can be measured directly, but can be determined more simply from standard measurements which are given in every textbook on X-ray therapy and can be obtained also in chart form. The charts are made up for a variety of wave lengths or voltages and varying portals. Charts of anatomical cross-sections have been published by Holfelder and Desjardins. The measurements for irradiating a definite point can be made by a cyrtometer tracing of the dimensions of the body and the depth dose determined for any specific point.

Another factor concerning which there is still some difference of opinion is the rate at which a dose should be administered. Regaud's biological experiments and clinical observations made under his supervision indicate that lengthening of the time of exposure increases the differential between the effect of the rays on the tumor tissue and on the healthy structures. If the irradiation is given at a low intensity, the normal structures can repair the damage which they receive and escape irreparable injury, whereas the cells of some, though not all, tumors are not susceptible to such effective repair and therefore may be damaged or destroyed by prolonged irradiation when a more rapid administration of a given quantity of energy would not produce so satisfactory a therapeutic result.

The measurement of irradiation given by radium or the gas that it gives off, radon, is discussed briefly, as are also the computation of doses and the methods of application. In a general way, the effects of radium are estimated largely by direct methods whereas those of the roentgen rays are more often estimated indirectly. Because of technical difficulties it has not yet been possible accurately to measure radium in terms of roentgens.

ADOLPH HARTUNG, M.D.

Meldolesi, G.: The Roentgen Diagnosis and Treatment of Bone Tumors Secondary to Epithelioma of the Breast and Uterus (*Diagnostica e terapia radiologica dei tumori ossei secondari ad epiteloma della mammella e dell'utero*). *Radiol. med.*, 1931, xviii, 615.

The author has followed up twenty-six cases of bone metastases from epithelioma of the breast or

uterus. Some of them he followed throughout their course. Such bone metastases are quite sensitive to the roentgen rays. Therefore life may be considerably prolonged if they are subjected to roentgen treatment. As successful treatment depends upon early diagnosis, the author describes the early roentgen appearance of the metastases. His discussion is supplemented by roentgenograms made in the cases he reviews.

The metastases may cause increased density or rarefaction of the bone and may be circumscribed or diffuse. The form with increased density which is at first circumscribed appears as an intensely opaque and generally irregularly, rounded isolated nodule. The rarefying form which is circumscribed at first is characterized by one or more isolated points of rarefaction which cannot be seen until they have reached a certain size. These points may be in the central part of the bone or in the cortex. There is no increase in the density of the bone around them. In metastases causing increased density which is diffuse from the beginning there are small, intensely opaque spots the size of a pin-head which tend to become confluent and form large opacities. In metastases with rarefaction which is diffuse from the beginning large areas of the skeleton show small round points of rarefaction which have very distinct outlines and give the bone a cribrate appearance. As the signs are rather vague and not particularly characteristic at first, roentgenograms should be taken at intervals of a few days. Stereo-roentgenograms are of special value.

AUDREY GOSS MORGAN, M.D.

RADIUM .

Flaszen, J., and Wachtel, H.: *Investigations on Chemical Changes in Cancer Tissue Following Radium Irradiation and Their Significance as Regards the Treatment of Cancer* (Aus Untersuchungen ueber chemische Veraenderungen im Krebsgewebe nach Radiumbestrahlung und ihre Bedeutung fuer die Behandlung des Krebses). *Warsaw. Czas. lek.*, 1930, vii, 1096.

In view of the fact that maleic acid is the prototype of what is called intestinal acid by Freund and Kaminer, a solution of maleic acid was irradiated with radium. Maleic acid is preformed in the blood pigment. Platinum applicators from 0.5 to 1.0 mm. thick were immersed in a 0.1 to 1.0 per cent solution of the acid and an experimental dosage, the same as the carcinoma dose ($\pm 1,200$ mg.-hr. to 3 c.cm.) was given.

The radium produced a change in the chemical character of the irradiated substance. The acid content of the solution was diminished and the melting point was reduced. Most striking, however, was the discovery that the irradiated maleic acid lost its property as a protective body for carcinoma cells. Carcinoma cells to which the serum mixed with irradiated maleic acid was added, underwent cytotoxicity (from 60.9 to 85 per cent), whereas

the same serum with the addition of unirradiated maleic acid acted in the same way as carcinoma serum. It was found that during the radium irradiation a change occurred also in the biochemical properties of the maleic acid. Irradiated maleic acid to which carcinoma cells of mice suspended in serum were added, inhibited the development of carcinoma after implantation to an extent of 80 per cent, and unirradiated maleic acid favored the development of the implanted tumor.

After elimination of the β rays, which originate in the secondary β irradiation, no changes appeared in the maleic acid. From this fact the authors conclude that the chemical and biological changes are produced by the β rays. When the same solutions were irradiated with roentgen rays (no filter, 160,000 volts, and 2 ma. current strength in the lamp), there was no change in the chemical properties of the maleic acid, but after experiments with the cytolytic method changes in the biological properties were demonstrated. It is therefore evident that the effect of the roentgen rays is much weaker. Similar effects, but more pronounced than those noted after roentgen irradiation, were obtained by irradiating the maleic acid solution with ultraviolet rays of the Bach quartz lamp.

As irradiation of maleic acid with the β rays of radium almost completely destroys the protective action of the acid for carcinoma cells, the authors believe that the early reaction observed in radium-irradiated tumors is due to analogous changes produced by the β rays in the substance which protects the carcinoma cells before the occurrence of cytotoxicity by the defensive forces of the organism. Therefore, in addition to the previously known action of radium on carcinomatous tissue, which is due chiefly to the γ rays, there is apparently a second effect which is due chiefly to the β rays. This process is masked by the caustic effect of the β rays. Only by the use of very hard and considerably reduced β rays is the caustic effect prevented. The chemical mechanism is then revealed plainly by an early clinical reaction in the irradiated tissue. The authors designate this process as a "histolytic mechanism." They state that the histolytic effect may lead to retrogression of the tumor. If the resistance of the organism is very weak, the clinical effect may be absent before the effect of the γ rays becomes apparent after the latent period. In general, the authors observed combined effects; the tumor was found to retrogress considerably under the influence of the histolytic effect, but was destroyed completely only by the γ rays.

H. Beck (G).

MISCELLANEOUS

Winterstein, O.: *The Value of Ultraviolet Rays in General Surgery* (Ueber die Bedeutung der ultravioletten Strahlen in der allgemeinen Chirurgie). *Beitr. z. klin. Chir.*, 1930, cli, 203.

Pathogenic and non-pathogenic micro-organisms can be inhibited in growth or killed by ultraviolet

rays. The various individuals of a strain of micro-organisms as well as different varieties of micro-organisms differ in their resistance to the ultraviolet rays. Old cultures are more resistant than fresh cultures. Fresh cultures of most organisms are inhibited in growth by a dosage less than the human abdominal skin-erythema dose, and cultures six hours old, by somewhat larger doses. The lethal dose for fresh cultures lies at, or considerably above, the abdominal skin-erythema dose, while that for cultures six hours old is within the range of a powerful burn dose. The streptococci are particularly sensitive to the irradiation; their lethal dose lies within a range that can be applied to human beings without harm. The lethal dose for staphylococci and the colon bacillus is larger, and that for the tubercle bacillus is very high.

The bactericidal effect of ultraviolet rays upon the skin has been demonstrated. The possibility of killing bacteria without injuring the skin depends

upon the individually and locally varying resistance of the skin to the rays. From the bacteriological standpoint, a hand and forearm disinfection might be possible for the surgeon. Ultraviolet rays have a lethal effect upon bacteria in the air, but they cannot sterilize infected suture material and only slight results can be expected from their action on bacteria in wounds. They do not cure or inhibit erysipelas.

The reports in the literature as to the histological changes in the epidermis have been confirmed by the author's investigations. It appears not improbable that ultraviolet rays, in their totality, act as a direct stimulant to healing. A bactericidal effect and stimulation of cell division cannot occur simultaneously. There is no retardation or acceleration of the healing of freshly sutured wounds after a single ultraviolet irradiation near the burn dosage. Ultraviolet light exerts a stimulating effect upon the epithelium in only a small percentage of wounds and only to a slight degree.

S. FRAY (2).

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Soisalo, P.: The Blood-Sugar Curve in the Normal Human Being, With Special Consideration of Standardization of the Diet (Ueber die Blutzuckercurve des gesunden Menschen, mit besonderer Berücksichtigung der Standardisierung der Diät). *Acta Soc. med. Fennica Duodecim*, 1931, xiii, No. 2, 3.

The author made glucose-tolerance tests on forty-three normal men and women between the ages of nineteen and thirty-nine years. For two days before the tests twenty of the subjects were fed a standardized diet yielding 35 calories for each kilogram of body weight. Sixty per cent of the diet was carbohydrate; 25 per cent, fat; and 15 per cent, egg albumin. Twenty cubic centimeters of fluid per kilogram of body weight were given each twenty-four-hour period. The blood sugar was estimated by the Hagedorn-Jensen method. One gram of glucose per kilogram of body weight was given in 10 per cent solution.

The purpose of the tests was to answer the following questions:

1. Is it possible to eliminate the fluctuations in the blood-sugar curves of different persons with the aid of a standard diet and otherwise similar experimental conditions?

2. Is it possible to eliminate the fluctuations in the blood-sugar curve of one and the same individual under the conditions mentioned?

3. Is it necessary to standardize the diet when carrying out sugar-tolerance tests?

He answers all of these questions in the negative.

His experiments showed that in normal persons the blood sugar is at most 0.11 per cent when the stomach is empty. In the glucose-tolerance test it increases to 0.20 per cent at most and sinks again to 0.11 per cent or lower before two and a half hours have elapsed. However, the upper limit of the curve does not differ so very greatly from the lower borderline found in diabetic patients and may sometimes coincide with the latter. LOUIS NEUWELT, M.D.

Baldridge, C. W., and Needles, R. J.: Idiopathic Neutropænia. *Am. J. M. Sc.*, 1931, clxxxi, 533.

The authors apply the term "idiopathic neutropænia" to the syndrome commonly called "agranulocytic angina" because angina is inconstant in the syndrome and a decrease in the cells of the myeloid series is more correctly termed "neutropænia." Moreover, the cause and pathogenesis of the syndrome are entirely unknown.

In addition to four cases of idiopathic neutropænia, the authors report cases in which stomatitis was associated with severe leucopænia such as

occurs in arsphenamin poisoning, radium-paint poisoning, trinitrotoluene poisoning, chronic benzene poisoning, aplastic anæmia, and acute leukæmia. They believe that stomatitis is a common secondary manifestation in blood dyscrasias characterized by neutropænia, and that it is of no etiological importance. The cases they report bear out the theory that neutropænia precedes evidence of infection.

Following a discussion of the theories advanced regarding the cause and nature of neutropænia, the authors suggest that the necrosis of the bone marrow might be due to a local tissue reaction of anaphylactic or other nature. MAURICE MEYERS, M.D.

GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Kendall, A. I.: Observations upon the Filterability of Bacteria, Including a Filterable Organism Obtained from Cases of Influenza. The James A. Patten Lecture in Bacteriology. *Northwestern University Bulletin, Medical School*, 1931, xxxii, No. 5.

Viruses of such diseases as smallpox, vaccinia, measles, rabies, influenza, the common cold, poliomyelitis, encephalitis, and others are exceedingly refractory to growth in artificial culture media outside the animal body. The media at present available for cultivation depart radically from the physical nature and chemical composition of the natural habitat, and the more closely media approximating the nature and composition of the living tissue are prepared the more nearly has there been some indication of multiplication of these "viruses" outside the animal body. Comparing artificial media with the natural environment of the "viruses," one notes that the artificial media contain protein-degradation products, peptones, and meat extractives with little or no unaltered or nearly unaltered protein. The tissues of the body, on the contrary, contain unaltered protein, and little or no peptone or other protein-degradation products.

A theoretical approach to cultivation of the "viruses" would appear to be the preparation of a sterilizable medium which, like body tissues, contains unaltered protein and little or no peptone or other protein-degradation products such as are found in ordinary culture media. Such a medium has been prepared. The essential ingredient is the small intestine of man, swine, dog, or rabbit, thoroughly extracted, first with alcohol to remove water and alcohol-soluble extractives and then with benzol to remove lipoidal substances. The residue when dried and powdered will keep indefinitely. This powder, suspended in Tyrode's solution or normal saline solution may be sterilized in the autoclave

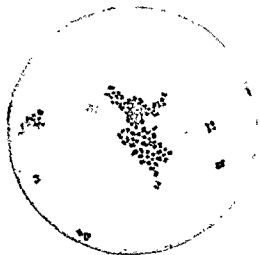


Fig. 1. Diplococcus from a case of influenza, showing variation in size and in the intensity of the staining.

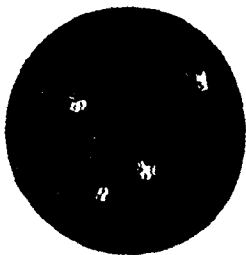


Fig. 2. Diplococcus from a forty-eight-hour culture of influenza in K medium. Dark-field illumination showing granules.

and forms a medium which possesses most unusual qualities. For brevity, it is termed "K" medium.

From bloods taken from influenza patients organisms were isolated which produced paroxysms of sneezing in rabbits. From the rabbit inocula and from the bloods of the rabbits a filter-passing "virus" was cultivated in K medium. From the K medium cultures a coccus was isolated. The coccus, unfilterable, could be transformed to a filterable state on K medium, refiltered, and recovered again after development in K medium and growth on agar as an unfilterable coccus.

The filterable state is readily induced by inoculation of the cocci into K medium. The converse process of transformation of the filterable into the non-filterable state is relatively slow. It can be done by inoculation of K medium growths upon intestine-protose-peptone agar. Other organisms have been made filterable, filtered, and recovered again in the non-filterable state, namely bacillus typhosus, Rosenow's poliomyelitis streptococcus, Dochez's scarlet fever streptococcus, bacillus paratyphosus alpha, Noguchi's leptospira icteroides, and staphylococcus aureus. Staphylococcus bacteriophage, and Besredka's "staphylococcus antiviral" have each yielded typical non-filterable staphylococci upon cultivation in K medium.

Positive blood cultures have been obtained from cases of common cold, arthritis, rheumatoid endocarditis, rheumatic fever, measles (the latter thirty hours before the appearance of the rash), and German measles. Thus it would seem that many pathogenic organisms are capable of existing in two states, namely, a non-filterable easily cultivated state growing well in ordinary culture media containing little unaltered protein but considerable amounts of peptone and protein-degradation products, and a filterable state incapable of development in media containing ordinary constituents but culturable in

media containing unaltered protein with little or no peptone and other protein-degradation products.

The sequence of changes which lead to the formation of the filterable state may be observed by inoculating bacillus typhosus into K medium. When examined at intervals under the dark-field, the bacilli lose their homogeneity, appear as faintly discernible actively motile shadows with a bacillary outline. Brilliantly luminous small granules appear within the shadowy outlines of the organisms, from two to four or more such granules to each bacillus. The addition of specific typhoid serum to such cultures causes agglutination, but the time required is longer than that necessary to produce agglutination in parallel peptone broth cultures containing only typical typhoid bacilli. On retransfer and re-incubation in K medium, the bacillary forms become smaller and are finally lost. Methylene-blue stains at this stage show very small, faintly blue-staining rod-shaped bodies enclosing more deeply stained reddish granules suggesting rickettsia bodies found in lice. These granular vestiges of bacillus typhosus readily pass an N Berkefeld filter. The bacillary state may be recovered by appropriate cultivation.

The paucity of protein-degradation products, peptones, etc. in the respiratory tract (in the absence of pus infection) may explain the association of the "filterable viruses" with respiratory diseases rather than with diseases of the intestinal tract, the mucosa of which is bathed in protein-degradation products. Thus bacteria in the intestinal tract are in an environment conducive to maintenance of the non-filterable state, while conditions in the respiratory tract are more favorable to the formation of the filterable state.

Experimental evidence indicates that bacteria may rapidly be made to pass into the filterable state

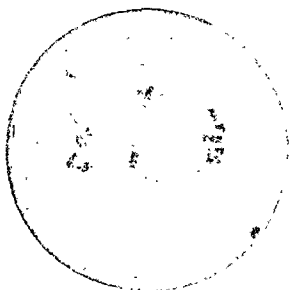


Fig. 3. *Bacillus typhosus* after twenty-four hours' growth in K medium, showing granules and faintly staining residuum of organism



Fig. 4. *Bacillus typhosus* after forty-eight hours' growth in K medium. Dark-field illumination showing granules.

by cultivation in K (protein) medium. The converse is also true because several successful cultivations of bacteria of various types have been made from the blood stream in cases of influenza, common cold, arthritis, rheumatic fever, measles, and other pathological states, in which, heretofore, attempts at cultivation in artificial media have been rather uniformly negative, although the presence of bacteria has been expected for a long time. Applying the same reasoning, from experience gained by the use of K (protein) medium, to infections in the body, it seems logical to assume that as soon as bacteria in the non-filterable state (as they exist in culture), pass into the tissues through barriers that ordinarily serve to keep them out, they are in a protein environment free or nearly free from peptone and similar products of protein degradation. Under these conditions bacteria may be expected to change from the non-filterable to the filterable state. This filterable or granular state facilitates their migration in the body. Indeed, the existence in the filterable or granular state perhaps may be sufficient to explain why bacteria as such are so infrequently demonstrated by culture or staining in body tissues, except where pus collects. As pus is rich in protein-degradation products, it forms an environment favorable for the change to the non-filterable state.

The relations of the filterable state of bacteria to phagocytosis and to serological immunity have not as yet been studied. A large number of problems immediately arise from this dual type of existence.

The author's summary and conclusions are as follows:

1. The isolation of a filter-passing diplococcus from the blood of certain cases of influenza by means of a special culture medium is described. The experimental effects of this organism, while in the filterable state, upon rabbits is discussed.



Fig. 5. *Leptospira icteroides*. Two weeks in K medium. Granulation complete. Organism filterable. Dark-field illumination.

2. A procedure is formulated for inducing at will both a filterable and a non-filterable state in bacteria. Mention is made of a series of experiments in which both the filterable and the non-filterable state have been thus induced in a series of well-known bacteria representing a variety of types.

3. It is postulated that a majority, if not all known bacteria exist in a filterable and a non-filterable state.

4. A preliminary report of the isolation of microbes in the blood not only in cases of influenza but also in cases of common cold, rheumatic fever, arthritis, from staphylococcus bacteriophage and Besredka's staphylococcus antiviral is presented.

evidence of the universal application of the procedure.

5. An explanation of the chemical basis for the existence of bacteria in both the *filterable* and the *non-filterable* state, in the animal and human body and in cultures is proffered.

6. The relation of this chemical concept to microbial infection and the state of microbes in the body during infection is discussed.

HENRY I. STURBLEFIELD, M.D.

EXPERIMENTAL SURGERY

Kubányi, E.: Evaluation of the Principles of Tissue Culture in Practical Surgery (Die Bewertung der Prinzipien der Gewebezucht in der praktischen Chirurgie). *Orvosi hetil.*, 1930, ii, 1134.

Tissue culture is dependent upon three factors: (1) the medium, (2) the temperature, and (3) an unknown thermolabile factor present in embryonal extracts which cannot yet be isolated and has been designated by Carrel as "trephone."

The action of the embryonal extracts which is independent of the species (heterogenic) was demon-

strated in three experiments. The findings are shown by photomicrographs.

It was found that the heart muscle of the human embryo develops as well in chicken plasma with extract of the chicken embryo as in human plasma with extract of the human embryo. In tissue regeneration *in vivo* conditions are similar except that the leucocytes provide the irritating substance (trephone). Leucocyte extracts contain small amounts of trephone.

Clinical experiments were made with gauze saturated with chicken-embryo extract in cases with chronically delayed formation of granulations or with large cavities which had to be filled with granulations rapidly. At the end of ten days biopsy showed fresh granulations well supplied with blood, and macroscopic examination of the wound showed that it had diminished in size.

The chicken-embryo extract was prepared from embryos removed from eggs that had lain in the thermostat for from eight to ten days with precautions to keep them sterile. These embryos were worked up into a homogeneous pulp and centrifugalized, the thick mucous fluid then being taken off with a pipette.

FELDMAN (Z).

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NOTE:—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

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INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Greig, D. M.: Localized Congenital Defects of the Scalp. *Edinburgh M. J.*, 1931, xxxviii, 341.

Localized congenital defects involving the whole thickness of the hairy scalp but not extending to the bone and not associated with osseous defects are of two types. One is a bulla or a raw surface, and the other is membranous or cicatricial. It is possible that the two types are related, but they are dissimilar and their co-existence is unusual. The bulla or raw surface form appears as a punched-out ulcer extending to the galea aponeurotica. In the membranous form the area is fibrous.

These defects are associated with other congenital defects such as cleft palate and harelip. In the author's opinion it is more probable that they arise from an arrest of development than, as has been suggested, from amniotic adhesions in the fetus.

MANUEL E. LICHTENSTEIN, M.D.

Axhausen, G.: The Pathology and Therapy of the Temporomandibular Articulation (*Pathologie und Therapie des Kiefergelenkes*). *Fortschr. d. Zahnk.*, 1931, vii, 199.

If, as not infrequently occurs in cases of acute inflammatory changes in the region of the parotid gland, the causative suppurative in the temporomandibular articulation is not recognized in time, the falsely directed therapy (for acute parotitis or suppurative of the middle ear) may result in a long siege of illness and inflammatory locking of the jaw followed by complete ankylosis and bony union of the surfaces of the joint. The early treatment should consist of injections of rivanol and arthrostomy, and the late treatment, of resection of the head of the jaw bone and the interposition of fascia.

Of the chronic affections of the temporomandibular articulation, specific tuberculous infection and specific luetic involvement, at least in isolated form, are rare. Rare also are rheumatic inflammation and "deforming" diseases of the joint characterized by

marked changes in the capitulum. The most frequent affection is the chronic condition characterized by snapping or jerking in the jaw movements, momentary inability to close the jaw (habitual subluxation), and locking of the jaw (contracture).

On the basis of the reports of Konjetzny, von Stapelmohr, Lotsch, and Dufourmental, his own operative and histological observations, and photographic records of the mandibular movements in the various disturbances of mobility of the jaw, Axhausen distinguishes "terminal" or habitual subluxation or luxation from the "intermediate" form which is due, not to inflammatory changes in the joint, but to injury of the articular disk. According to Konjetzny and von Stapelmohr, liberation of the cartilaginous articular disk posteriorly and its displacement forward to check the abnormal anterior movement of the capitulum is indicated in cases of habitual luxation, but is unnecessary and disadvantageous in cases of simple crepitation and secondary contracture. In the latter the operation of choice is extirpation of the cartilaginous disk. The incision recommended is that of Bockenheimer.

Axhausen discusses the extensive resection of the temporomandibular articulation practiced by Blair to relieve ankylosis and correct retrognathism (forward displacement of the jaw, which then hangs free, being no longer in contact with the base of the skull and depends for its movement entirely on the muscles). He discusses also the more or less extensive removal of the capitulum for the correction of prognathism. When the joint is normal, extra-articular osteotomy on the ascending ramus is at least equally effective.

GEORG SCHMIDT (Z).

EYE

Mandels, S.: Injuries of the Eye from an Indelible Pencil (*Augenverletzungen durch Tintenstift*). *Arch. Ophthalm.*, 1930, vii, 861.

Mandels reviews seventy-six cases of injuries of the eye caused by indelible pencils. A number of the

patients were prisoners between the ages of fourteen and seventeen years. In many cases the injuries occurred several times in the same patient. Child prisoners often intentionally introduced the powder or pieces of an indelible pencil into the conjunctival sac, where the methyl violet acted upon the eye for days and produced destructive changes.

Mandels divides his seventy-six cases as follows:

1. Mild cases showing discoloration of the conjunctiva, conjunctivitis, and occasionally slight clouding of the cornea. The duration of the condition ranged from a few days up to two weeks. Recovery resulted.

2. Cases of medium severity with marked conjunctivitis and keratitis and often vesicle formation. The duration of the condition ranged up to three or more months. The result was often a more or less marked cicatrization of the cornea.

3. Severe cases showing necrosis of the conjunctiva, ulcers of the cornea, hypopyon, and iritis. In one patient there was panophthalmia and in another a severe iridocyclitis which necessitated enucleation. The final result was usually a leukoma or symblepharon.

In the patients who inflicted the injury upon themselves, most of whom were children, mental defects were usually noted.

As treatment, the author recommends several instillations of a 5 per cent solution of tannin. Tannin forms an insoluble compound with the anilin. For severe cases, diphtheria serum is recommended. The blood picture remains unchanged.

The results in the author's cases were blindness in fifteen cases, vision under 0.1 in eight cases, vision from 0.1 to 0.5 in fifteen cases, and vision from 0.6 to 1.0 in thirty-five cases. The result in three cases is unknown.

T. WERNCKE (O).

Parker, W. R.: Uveitis Associated with Alopecia, Poliosis, Vitiligo, and Deafness. *Am. J. Ophth.*, 1931, xiv, 577.

The author adds two cases of uveitis associated with alopecia, poliosis, vitiligo, and deafness to the seventeen cases which have been previously reported, and reviews the theories advanced as to the cause of the condition. According to one theory, the uveitis is due to a focus of infection and the changes in the uveal pigment are anaphylactic phenomena. According to another, the entire picture is due to a common source of infection. According to a third, the condition is the result of an endocrine disturbance. THOMAS D. ALLEN, M.D.

Heine, L.: Ciliary Epithelial Tumors. Remarks on the Reaction of the Ectodermal Elements of the Secondary Optic Vesicle (Ueber Ciliepitheletumoren. Mit Bemerkungen ueber die Reaktionen der ektodermalen Elemente der sekundären Augenblase). *Graves Arch.*, 1930, cxv, 481.

If a detachment of the retina progresses beyond the ora serrata and by extending into the pars ceca, separates the layer of pigmented epithelium from the

unpigmented layer there occurs a hitherto but meagerly studied reaction of the pigmented ciliary epithelium in the form of a proliferation which appears in the microscopic section as a spindle-shaped thickening. This may suggest a melanosarcoma of the choroid, but may be distinguished from the latter by its intact lamina elastica. The cells may show a tubular, lamellar, or acinous arrangement, and there may be a greater amount of intercellular substance than in melanosarcoma. Blood-vessel development from the uvea may introduce the mesoderm into participation in the process.

On the basis of the study of twenty cases Heine is able to distinguish four stages ranging from the first appearance of slight thickening to the development of a large tumor. This apparently specific reaction of the pigmented ciliary epithelium to contact with the fluid secreted in detachment of the retina leads the author to compare the reactions of the four zones of the ectodermal constituents of the secondary optic vesicle as follows:

1. The optic zone. The outer layer (pigment epithelium) reacts to familiar noxa by pigment degeneration, to inflammatory irritations by proliferation, to mechanical stretching by myopic dehiscences, and to detachment of the retina by tubular, lamellar, or cord-like growths, while the inner layer (retina optica with its twelve layers) reacts to the irritation of general affections which tend to involve the retina, such as nephrosis, arteriosclerosis, chlorosis, carcinosis, lipemia, and diabetes.

2. The pars ceca plana. This reacts to external stimuli (detachment of the retina) by the proliferation described, and the internal pigment-free layer, lifted off of the pigmented stratum, reacts to an internal stimulus (due to an unknown, local cause) by the production of unpigmented adenomata and proliferation of the pigment-free ciliary epithelia.

3. The pars ceca plicata and the ciliary process. These react to endocrine stimuli by desquamative processes which are in turn the cause of certain forms of detachment of the retina and glaucoma: pigment disintegration and dispersion and the deposition of pigment on Descemet's membrane.

4. The epithelial layer of the posterior surface of the iris. This reacts to diabetes by a characteristic loosening and casting off of the epithelium.

P. WAETZOLD (O).

Kirby, D. B.: Calcium in Relation to Cataract. I. In Vitro. II. In Vivo. *Arch. Ophth.*, 1931, v, 856, 868.

The author has been able to grow cultures of lens epithelium from chick embryos through many generations and has made a study of the effect of various concentrations of calcium on the growth of the cells. He found that relatively large increases in the calcium content of the media had very little effect on the growth of the cells, whereas slight decreases in the calcium content produced toxic reactions.

The normal concentration of calcium in the blood serum, aqueous, vitreous, and lens is discussed. In

tetany, the serum calcium is reduced and cataract is frequent. In cases of senile cataract, latent tetany was not demonstrable. In the author's opinion, deposits of calcium in senile cataractous lenses are secondary rather than primary. Metabolic studies of calcium balance in patients with mature cataracts showed no variation from the normal. Kirby concludes that there is no indication for calcium or parathyroid therapy in cases of senile cataract.

SAMUEL A. DURR, M.D.

Amsler, M.: The Gonin Operation (Ueber die Goninsche Operation). *Klin. Monatsbl. f. Augenh.*, 1931, lxxvii, 1.

According to the Gonin theory regarding detachment of the retina, the tear is produced by avulsion of the retina at a point where it has become pathologically adherent to the vitreous body. The tear is not an accidental finding. It is always present and is an essential feature of the condition. Occasionally it must be sought at the extreme periphery of the ophthalmoscopic field. The purpose of the Gonin operation is to close the tear and fix the retina tightly to the wall of the bulb by cicatricial tissue. Frequently the tear appears as a red spot on a red base in an apparently re-attached retina. Nevertheless, when the tear is closed surgically the avulsed retina must be replaced.

In examination for detachment of the retina an examination of the vitreous body is of the greatest importance. It has been definitely established that the changes in the vitreous body considered responsible are related to disease of the choroid. Moreover, it is probable that the disease of the uvea responsible for the intra-ocular processes is associated with certain changes in the general condition. Gonin considers detachment of the retina as a disease with both a local and a general character.

A most careful and complete examination of the whole eye is necessary. The field of vision must be determined with different intensities of light and on several occasions. If signs of a subsided or an active anterior uveitis are found, the anterior portion of the bulb should be examined with the slit-lamp. The pressure should be determined and transillumination carried out. Good dilatation of the pupil should be obtained and, if necessary, a subconjunctival injection of adrenalin should be given. The record of the ophthalmoscopic findings should be used as the basis for a special scheme for topographic ophthalmoscopy (Amsler and Dubois). In Lausanne, the topographic determination of the tear is carried out most simply in the following manner:

In the determination of the meridian, the point on the part of the limbus opposite the site of the tear which lies on a line with the center of the cornea and the site of the tear is marked with a needle and India ink. To determine the parallel, the distance of the tear from the corneal limbus in the given meridian is estimated so that, to the distance of the tear from the ora serrata measured in pupillary diameters (one pupillary diameter equals 1.5 mm.),

8 mm. (the distance of the ora serrata from the limbus) is added. In order to have the pupillary diameter scale available in the periphery, the Haab pupillary scale is held against the corresponding temple by the patient.

The patient is prepared for the operation of occluding ignipuncture both by general measures such as intestinal evacuation and by local measures. The eye is anesthetized with a 2 per cent solution of cocaine. If possible, two assistants should be at hand for the operation. A silk guiding thread is introduced exactly at the point marked with the India ink. Throughout the operation the thread is held a little taut and exactly through the center of the cornea. The so-called opposite point on the edge of the limbus near the tear is determined. The puncture must be made in the extension of the line connecting both points. A subconjunctival injection of about 2 c.cm. of a 2 to 5 per cent solution of novocain with adrenalin is made close to the sclera of the quadrant to be operated upon and ten minutes are allowed to elapse. A thick flap of conjunctiva is then formed (the sclera being cleanly exposed) and two threads are introduced to be used for closure immediately after the ignipuncture. The point of operation in the given meridian is marked in millimeters from the limbus. The distance is measured with the compass used by Gonin or with a marker devised by Amsler, and the point is marked with India ink. The puncture is made with a Graefe or hook knife. After evacuation of the subretinal fluid, the ignipuncture is carried out by introducing the red Paquelin cautery point for one or two seconds from 3 to 5 mm. deep into the opening made by the knife puncture. The threads are then immediately tied, the guiding thread is removed, and the patient is placed in the position indicated by the site of the operative field.

If the site of operation is in the vicinity of a muscle, one of four procedures may be used: (1) the knife and cautery may be introduced directly through the muscle; (2) the muscle may be drawn aside by means of a hook by an assistant; (3) the muscle may be split longitudinally; or (4) the insertion of the muscle may be cut and the tendon sutured in place again after the ignipuncture. The best procedure is lateral displacement of the muscle. If considerable rotation of the bulb is necessary, slings of thread may be drawn through the insertions of the recti muscles.

For several days after the operation the patient is kept in a position in which the bulb contents with their entire weight fall on the site of the operation. The first dressing is left on for forty-eight hours. Thereafter the dressings are changed every twenty-four hours, always over both eyes and with the instillation of atropin. The first ophthalmoscopic examination after the operation is made at the end of six days. As a rule the patient is allowed to get up after fourteen days.

A recurrence due to insufficient closure of the tear is designated by Gonin as a "réchute," and a recur-

rence due to a tear in another portion of the fundus as a "récidive."

Up to the present time only the Pacquelin cautery has been used in Lausanne.

Of seventy-four eyes examined, the author operated upon only twenty-nine. Of the latter, twelve were cured in the sense that complete re-attachment of the retina was achieved. Cases in which an old detachment was an incidental finding, cases of traumatic detachment, and cases of detachment due to tumor are not included among the seventy-four cases reviewed. The majority of the detachments had been present for several weeks or months, a year, or even longer. In eight cases, operation was contraindicated by clouding of the media (maculae corneae, occlusion of the pupil, incipient senile cataract, aphakia with secondary cataract and insufficient mydriasis, or dense, hemorrhagic clouding of the vitreous body) which rendered it impossible to examine the fundus properly for a successful operative procedure. In ten cases operation was not performed because the tear in the retina was too large or was located in the region of the macula, or multiple tears and holes were present. In four cases operation was regarded as inadvisable because of the presence of more or less pronounced cyclitic phenomena with a distinct hypotonia, and in two cases, because of severe secondary changes in the vitreous body and retina. In twenty cases it was contraindicated because the tear was not definitely demonstrable and there were marked changes in the retina and vitreous body. The tear is found regularly only in cases in which it has been present for a relatively short time (from two to three months). Only cases in which it can be demonstrated positively should be operated upon.

Among the seventeen cases in which the results of operation were unsuccessful, three were operated upon "for demonstration," being hopeless from the very beginning, and seven or eight were cases in which today, as the result of his experience, the author would not use the cautery. From cases of the latter type, Amsler has learned not to underestimate the "disease" condition of the bulb as a whole. In four of the author's cases in which the results were unsuccessful, complications developed immediately after the operation.

In the fifteen cases with good results the factors favorable to a successful outcome from the Gonin operation were: (1) a single, typical, and not too large tear of the retina located in the equatorial region, (2) a sector-shaped, elevated, and movable portion of retina in more or less clear relationship to the tear, (3) an almost unclouded vitreous body, and (4) an absolutely unirritated anterior portion of the bulb. These were typical surgical cases.

The detachment is a sudden, mechanically produced phenomenon occurring in the course of a protracted preparatory disease of the entire eye. It is not the end of the "detachment disease." The disease progresses. The so-called "complications" of detachment of the retina (iridocyclitis with hypo-

tonia, clouding of the lens, increased pressure) are symptoms of the same basic disease. If the evidences of the "disease" become distinct in the clinical picture, the outlook for a successful result from surgery becomes less favorable. The signs of such disease which are of chief importance in the establishment of the indications for operation are as follows:

1. Uvea: extensive choroiditic foci, which are of little significance in the prognosis, and inflammatory changes in the anterior portion of the eye (iridocyclitis with deposits or only signs of bedewing) and hypotonia, both of which must cause serious misgivings.

2. Retina: multiple or very extensive tears and connective tissue-like permanent folds and avulsion of the retina at the ora serrata, which are present at the very beginning or occur during treatment.

3. Vitreous body: peripheral changes and thickenings immediately in front of the retina which often appear in the ophthalmoscopic picture as clear, shining granules and, in part, represent regular, circumscribed adhesions of the vitreous body to the retina.

"The prognosis of detachment of the retina and the Gonin operation depends upon the vitreous and not upon the choroid." The establishment of the indication for the operation is dependent also upon the integrity of the function of the macula, the patient's age, general condition, psyche, and social position, and the ability and experience of the physician. Physicians and patients should be taught that detachment of the retina should be treated as early as possible.

REICHLING (O).

EAR

Helsmoortel, J., Jr., and Nysen, R.: Cochlear Reflexes and Their Semeiological Value (Los reflejos cocleares y su valor semiológico). *Rev. oto-neuro-oftalmol. y de ciruj. neurol.*, 1931, vi, 89.

The authors review the literature dealing with the various methods of testing audition by means of the reflex of Muck, the cochlear reflex, the psychogalvanic reflex, and the cardiovascular reactions. Their own experiments dealt mainly with the cochlear reflex. This reflex was first described by Holmgren in 1876, and was introduced into otology by Schurrgin in 1911.

The cochlear reflex, if positive, undoubtedly constitutes a definite criterion of auditive excitability. If all extracochlear excitation is excluded, involuntary responses can be obtained only when at least a vestige of auditive faculty remains. By means of intense excitations, the threshold of residual cochlear excitability may be passed without difficulty. The intensity of the reaction is not proportional to the intensity of the auditive impression and in certain cases may attain the maximum as soon as the threshold of excitability is passed. The intensity of the reaction depends on numerous factors extraneous to cochlear excitation, such as the general reflex reaction of the subject, his attention, and

the degree of surprise. It is therefore evident that the general muscular reflex, the cochleopalpebral reflex, the reflex of Muck, the cochleopupillary reflex, and the psychogalvanic and plethysmographic reactions to sounds indicate only that hearing has not been entirely lost. They are of no aid in the evaluation of the grade of audition nor in determining whether the sense of hearing is sufficient to permit understanding of human speech.

At the present stage of our knowledge, the cochlear excitability indicated by the various reflexes mentioned in the case of a subject claiming to hear absolutely nothing does not justify us in forthwith excluding a possible organic cause of the pretended complete deafness. It must be borne in mind that if a central lesion is excluded, auditive excitability established by cochlear reflexes does not enable us to determine whether the case is one of hysteria, of simulation, or of deliberate exaggeration. The differential diagnosis depends on the possible existence of abnormalities or hysterical stigmata and on the general behavior of the subject. On the other hand, if it is assumed that speech operates through an affective process as intermediary, the psychogalvanic and the plethysmographic reactions furnish a means of determining the capacity of the subject to hear and understand the human voice in ordinary volume or in murmurs. Plethysmography especially deserves our attention because of the simplicity of the Wiersma technique.

The acoustic reflexes may fail to appear despite normal acuteness of hearing. Even with regard to the cochleopalpebral reflex, which is markedly constant, there are encountered approximately 10 per cent of recalcitrant subjects. The same is true as regards psychological reflexes. Only positive cochlear reactions permit definite conclusions regarding auditive excitability. Absence of reactions is merely an indication of organic deafness.

WILLIAM W. WHITELOCK, PR.D.

Klestadt, W.: Change in the Direction of Spontaneous Nystagmus and the Combination of Spontaneous Nystagmus with Nystagmus in Certain Positions of the Head in Disease of the Labyrinth (Ueber Wechsel der Richtung des Spontan-nystagmus und Kombination des Spontan-nystagmus mit Lagen-nystagmus bei entzündlicher Labyrinthkrankung). *Monatsschr. f. Ohrenh.*, 1930, Lxiv, 1294.

Bilateral spontaneous nystagmus and spontaneous nystagmus on alternate sides occur in association with a labyrinthine position reaction in labyrinthitis without complete loss of function. In the absence of endocranial symptoms, the nystagmus occurring in certain positions is to be regarded as a symptom of irritation of the inflamed peripheral organ.

The changing picture of the nystagmus phenomena can be explained by reciprocal irritation of the same sensory nerve ending and simultaneous irritation of several sensory nerve endings. If changes of position are not considered in the examination, a nystagmus

due to position may simulate a change in the direction of spontaneous nystagmus.

The occurrence of the labyrinthine position reaction in peripheral vestibular disease was shown in two cases of bilateral or alternating spontaneous nystagmus with serous labyrinthitis. The author reports also a case of typical position reaction which without this symptom, would have suggested circumscribed labyrinthitis.

WODAK (H).

Eisinger, K.: Non-Inflammatory Diseases of the Inner Ear (Ueber nichtentzündliche Erkrankungen des Innenohres). *Jahresk. f. aerztl. Fortbild.*, 1930, xxi, 29.

This review covers the entire subject of non-inflammatory diseases of the inner ear. Following a discussion of the symptoms of irritative and degenerative conditions of the cochlear and vestibular nerves, which are of importance in the diagnosis of general diseases, the author takes up metabolic disturbances. He discusses diabetes and gout, both of which are often combined with arteriosclerosis, and nephritis and uræmia. He then reviews the toxic affections of hearing, viz., from arsenic as an occupational disease or as a result of medication with sodium cacodylate, atoxyl, or salvarsan. He regards the so-called neurorecurrence of syphilis more as an arsenical intoxication than a purely syphilitic manifestation. Mercury and lead intoxications are industrial diseases.

A discussion of the injuries due to gases, including illuminating gas, carbon monoxide, and war gases, alcohol (ethyl and methyl), salicylic acid, quinine, and oil of chenopodium is followed by a consideration of the bacterial toxins, among which are included food intoxications. The infectious diseases mentioned are epidemic parotitis, osteomyelitis of the long bones, sepsis, and erysipelas. The leukæmias, the various types of tumors of the base of the skull, and the frequent arteriosclerotic changes are also discussed. Of the organic diseases of the central nervous system, multiple sclerosis with its inconstant syndrome frequently suggesting hysteria and syringomyelia may produce ear symptoms from the very beginning. The latter causes especially nystagmus. Encephalitis likewise affects chiefly the vestibular part. Other conditions mentioned are polynneuritis, neurasthenia, hysteria, and the "fright deafness" which was so common during the world war.

Disturbances in the female genitalia are closely related to the conditions last mentioned. Injuries to the base of the skull, explosion traumata, and caisson-workers' sickness are causes of occupational deafness. General affections of the skeleton may likewise involve the ear, but as a rule produce only mild disturbances of hearing. Besides rachitis and osteomalacia, the conditions of this type mentioned are senile osteoporosis, the osteitis deformans of Paget, and the osteogenesis imperfecta of Vrolik (osteospathyrosis).

In conclusion, Eisinger reviews the disturbances of hearing associated with endemic cretinism and

by a free period longer than that produced by drugs. The mental changes did not seem to be influenced by the operation. PACE.

Rake, G., and McEachern, D.: Experimental Hyperthyroidism and Its Effect upon the Myocardium in Guinea Pigs and Rabbits. *J. Exper. Med.*, 1931, liv, 23.

In a review of the literature on experimental hyperthyroidism and its effect on the myocardium, the authors state that Cameron and Carmichael found no change in the myocardium in hyperthyroidism, Farrant and Goodpasture noted only insignificant changes, and Hashimoto and Takane observed well-marked and extensive changes.

The authors compared the myocardium of twenty normal guinea pigs with that of seven guinea pigs given from 0.10 to 0.17 mgm. of thyroxin intramuscularly every other day for from four to eighty-three days, and the myocardium of forty-three normal rabbits with that of forty-four rabbits given from 0.10 to 0.35 mgm. of thyroxin intramuscularly every other day for periods of from two to thirteen days. The changes in the heart and other tissues of the hyperthyroid animals were insignificant and varied little from those seen in the normal control animals. Eight thyrotoxic guinea pigs developed a coincident pneumonia due to the bacillus bronchisepticus. All of these animals showed myocardial changes. It is suggested that the hyperthyroid condition may have rendered the heart more susceptible to the infection, but no infected animals without hyperthyroidism were studied. PAUL STARR, M.D.

McEachern, D., and Rake, G.: A Study of the Morbid Anatomy of the Hearts from Patients Dying with Hyperthyroidism. *Bull. Johns Hopkins Hosp.*, Balt., 1931, xlviii, 273.

The authors report the findings of a postmortem study of the hearts of twenty-seven patients who died with hyperthyroidism. In fourteen cases the heart was normal. In eight, moderate perivascular or intermuscular fibrosis or small round-cell infiltration was found, but similar changes were noted, though less frequently, in the control cases. In five, conspicuous alterations were found. In three of the latter there was co-existent heart disease of other causation. Cardiac hypertrophy was noted in sixteen of the twenty-seven cases.

In seven cases death resulted from congestive heart failure. In five of these there was associated heart disease due to other causes. Ten deaths occurred during or after operation. Nine of these were regarded as toxic deaths and one was due to bronchopneumonia. Death in hyperthyroidism is not due to heart failure unless associated heart disease is present. Auricular fibrillation occurred in nine cases. In four of these there were no evident histopathological changes. In two, there was associated heart disease of other origin.

The authors conclude that it is impossible to ascribe the cardiac phenomena of hyperthyroidism

to structural changes in the muscle, and that a search should be made for metabolic and functional alterations in the myocardium. PAUL STARR, M.D.

Rogers, J.: Therapeutic Failures After Operation for Hyperthyroidism. *Ann. Surg.*, 1931, xciii, 1031.

From the surgical standpoint, hyperthyroidism is of three types:

1. That originating in a simple localized tumor or toxic adenoma. This type has an excellent prognosis.
2. That caused by more than one toxic adenoma.
3. That resulting from a diffuse or general enlargement of the entire gland.

In the least dangerous technique the operation for the cure of hyperthyroidism is begun with division and elevation of the isthmus and attached lobes from the trachea. This obviates the traumatism to the posterior part of the gland which is caused by turning each lobe out by a finger inserted behind it.

Hyperthyroidism with a large goiter seems to have a better surgical prognosis than hyperthyroidism with a small goiter. The type of hyperthyroidism with a single adenoma, the type with multiple toxic adenomata, and the type with diffuse hyperplasia show a tendency to merge into one another. A thyroid with a single toxic adenoma may develop one or more other tumors, or a primary diffuse enlargement may have one or more nodules form within it.

The author concludes that hyperthyroidism represents an attempt at compensation. It usually begins with simple hypertrophy of the gland. The gland functions through an iodized secretion made by the alveolar epithelium. In the hyperthyroid condition there is a multiplication of the alveolar epithelial cells. Iodine usually decreases this proliferation, but sometimes increases it. The normal response of a "weak" thyroid to promote the production of energy is multiplication of the alveoli and their epithelium. If this proves insufficient, a more rapid proliferation of the epithelium occurs with resulting hyperthyroidism.

The purpose of operative interference is to reduce the quantity of secretion and check the apparent auto-activation of the gland.

Immediately after the operation the functioning of the thyroid should be conserved by gentle manipulation of the unexcised portion.

During convalescence the patient should be kept under constant supervision to prevent fatigue and its physiological equivalent in infection or emotional strain, and the thyroid should be supported by small amounts of iodine and by organotherapy.

R. V. B. SMER, M.D.

Charšak, M.: Chronic Stenoses of the Larynx and Their Surgical Treatment (Chronische Stenosen des Kehlkopfs und ihre chirurgische Behandlung). *Russk. Otol.*, 1930, xciii, 119.

The author recommends early laryngostomy for the treatment of stenoses of the larynx. This was carried out in 148 cases, including 59 of sclerosis, 52 of typhus fever, 7 of syphilis, 7 of diphtheria, and 4 of

typhoid fever. In 63 cases tracheotomy was done as a preliminary procedure, but the author recommends primary laryngostomy as in a large series of cases it was found that when this operation was performed early necrotic processes, sequestrum formations, and particularly cicatricial contractions and displacements were prevented and therefore the patient was spared a second operation. In a large number of cases in which a preliminary tracheotomy was done the patient refused to undergo a second operation as he had been relieved of his respiratory difficulties by the tracheotomy. The author does not share the view that early laryngostomy aggravates the disease process. Primary laryngostomy gave good results even in cases of typhus and in certain other cases with a temperature above 39 degrees C. It is no more hazardous than tracheotomy.

The operation is carried out under local anesthesia. A low tracheotomy is first done. Then, the upper tracheal rings and, if necessary, the thyroid cartilage are split up to the stenosis. When possible, the upper portion of the thyroid cartilage should be left intact. The mucous membrane and the external skin are then sutured together, with special care that no edges of cartilage protrude. After eight days the bougie treatment is started by pushing a wad of gauze with ointment upward. Later the patient is taught to use his finger for this purpose. Ultimately the laryngostomy opening is closed by a plastic operation performed in 1 stage. MITTMAIER (H).

Daševskaja, B., and Dombromyl'skij, F.: *Clinical and Biological Peculiarities of the Tuberculous Changes in the Outer Portion of the Laryngeal Tube and Their Pathogenesis* (Klinische und biologische Besonderheiten der tuberkulösen Veränderungen am äusseren Teil des Kehlkopfrohrs und ihre Pathogenese). *Vopr. Tuberk.*, 1930, viii, 23.

There are cases of tuberculosis of the larynx in which the tuberculous process is localized almost exclusively in the outer portion of the laryngeal tube (the epiglottis, arytenoid cartilage, and aryepiglottic folds). The peculiar clinical picture presented by

such cases is described by the authors on the basis of forty-eight of their own observations. They divide their cases into the following two groups:

Group 1, twenty-three cases. The process began in the larynx without involvement of the lungs. The patients were between twenty and thirty years of age. There were no bacilli in the sputum. Physical examination disclosed no changes in the lungs. The general condition was satisfactory. The temperature was subfebrile.

Group 2, twenty-five cases. The lungs showed typical changes. The patients were between thirty and forty years of age. Tubercle bacilli were found in the sputum. The biological reactions were positive. In its onset, its symptoms, and its course, the disease differed considerably from the ordinary tuberculosis of the larynx. The first and most important symptom in all of the cases was dysphagia, but the voice was almost always clear up to the last day. The disease began acutely after angina or grippe. At first, the epiglottis became flat, swollen, and infiltrated. The process then travelled on to the arytenoid cartilage and the aryepiglottic ligaments. The inner portion of the larynx remained unchanged or was only slightly involved. The epiglottis was affected in 98 per cent of the cases, whereas in ordinary laryngeal phthisis the incidence of typical changes in the epiglottis is only 13 per cent. The vocal cords and interarytenoid space—the most frequent localization of the tuberculous process—were involved in only 4 per cent of the cases.

The authors believe that in the type of case under consideration the infection reaches the larynx by way of the blood stream. In support of this theory they cite the absence of tubercle bacilli in the sputum in the cases of Group 1 and the fact that the external portion of the laryngeal tube has no depressions in which tubercle bacilli may be concealed.

The prognosis is very unfavorable. In both of the authors' groups of cases most of the patients died.

The treatment is purely symptomatic. A good result can be obtained only from strictly carried out sanitarium treatment.

BELINOFF (H).

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Tilney, F., and Kubie, L. S.: Behavior in Relation to the Development of the Brain. *Bull. Neurological Inst. New York*, 1931, 1, 229.

The authors' investigation was based upon the fact that all structures of the body must attain adequate differentiation before they are capable of specialized reactions. The maturing process in six different species (opossum, rat, guinea pig, pig, cat, and man) was followed with regard to the development of the brain and the development of behavior. The object of these studies was to establish chronological relations between these developmental processes.

In the structural investigation three methods are employed, (1) organogenetic studies by the Born method of reconstruction, (2) histogenetic studies, and (3) myelogenetic studies.

The results of the structural investigation up to the present time are given. The report includes a review of the developmental processes in the end-brain of the domestic cat which result in the formation of the paleocortex, archicortex, and neocortex. It shows that these processes pass successively through a three-layer and a four-layer stage, reproducing respectively ichthyopsid and reptilian conditions before the ultimate mammalian six-layer cortex is attained. It traces the development of the tract-beds which have neocortical connections. It concludes with a formula upon which the functional evolution of the neocortex in this mammalian species appears to be based, and suggests that the same formula, with certain modifications, may be applied to all mammals. DAVID JOHN IMPASTATO, M.D.

Van Rijnberk, G.: The Cerebellum (Das Kleinhirn). *Ergebn. d. Physiol.* Vol. 31. 1931: Munich, Bergmann.

Supplementing the work of Luciani which was published in 1904 and his own writings in 1908 and 1912, the author presents in detail the results of research on the cerebellum carried out during the last twenty years. He discusses first the morphology (among other things, histological maturation and retrogression due to age, the blood supply of the cerebellum, and the relation of the blood vessels to growth) and then the experimental results obtained in various species of animals. Of the latter, mention should be made of the discussion of complete or at least extensive resection of the cerebellum and the relations to decerebrate rigidity.

The ophthalmologist will be interested particularly in the demonstration that the reflex system of the cerebellum is related to the reflex system of the laby-

rinth, but that each is nevertheless independent of the other to a great extent and can function separately.

The tonic asymmetries caused by asymmetrical lesions of the cerebellum predominate (at least in the dog and cat) over the labyrinthine and neck posture asymmetries. Inhibitory stimuli pass from each nucleus dentatus to the vestibular center (tractus cerebellovestibularis) of the same side and from the cortex of the posterior lobe over the medial nuclei (nucleus tecti), uncinate gyrus to the vestibular nuclei (Groebels).

The paleocerebellum is a secondary regulator of equilibrium. Extirpation of portions of the cerebellum does not cause spontaneous nystagmus, but unilateral extirpation of the vermis and of the roof nucleus of the fourth ventricle induces hyperexcitability of the vestibular apparatus. In the cases of animals subjected to the latter operation the slightest movement of the head causes nystagmus. It is a rotatory or secondary nystagmus which ceases at once when the head is fixed.

With regard to the relations of the cerebellum to the sympathetic nervous system the author states that extirpation of a portion of the cerebellar hemisphere in rabbits was followed after five hours by a change in intra-ocular tension. In the eye on the side operated upon there was normal pressure or hypotension, whereas in the other eye there was hypertension. The pupil on the side of the operation was narrower than the other pupil. In the dog, an injury caudal to the fissura secunda caused an increase in the blood sugar.

The relations of the cerebellum to antagonistic muscle activity are dealt with only with respect to the muscles of the extremities. The author states that, contrary to the claim of Hering and Sherrington, the antagonists do not relax during the contraction of the agonists, but likewise undergo a more or less pronounced contraction. An important function of the cerebellum may be the proportional regulation and distribution of muscle-tonus increase in respect to time and intensity (co-ordination center).

A large portion of the article is devoted to the clinical contributions to our knowledge of cerebellar function. Unfortunately, lack of personal clinical experience limits the author to a review of the literature. In man, the cerebellum exerts an influence on vestibular nystagmus. On the homolateral vestibular nucleus its influence is inhibitory. If the inhibiting nerve fibers are destroyed on the right side by a cerebellar abscess, for example, the right labyrinthine nuclei are no longer inhibited, but are more strongly excited and, even if the right labyrinth has been previously destroyed or eliminated, produce nystagmus toward the right. With regard to the

cerebellar position of the head (increase in the neck reflexes) there is still a difference of opinion. In the presence of tumors there is often a symptom of pressure on the eighth nerve, the pons, or the medulla oblongata. Adiadochocinesia, absence of correlation between movements of the eye and the hand, Barany's "direction sign," myoclonic muscle contractions in diseases of the cerebellum (Klien's rhythmic deglutition spasms), disturbances of the sense of gravity, Goldstein's false localization, and cerebellar tremor are discussed briefly. The account of observations of cerebellar lesions caused by gunshot wounds in the world war and the description of tumor cases and of speech disturbances of cerebellar origin offer nothing of especial interest to the ophthalmologist.

The second part of the report is devoted to the localization problem. The author first describes the anatomy in detail, reviewing observations in comparative anatomy, the connections of tracts (the vestibulocerebellar tracts of the lower mammals are absent in the higher animals), and the relation of the basal cerebellar nuclei to the nucleopetal and nucleofugal and internuclear connections. In all mammals, Dieter's, Schwalbe's, and Bechterew's nuclei, which are connected with the cerebellar vermis and take part in the archikinetetic equilibrium functions, are found constantly. Equally constant is the medial complex with similar functions and paleokinetic relations (nucleus tecti and nucleus globosus), whereas the lateral complex (nucleus dentatus and nucleus emboliformis) is variable, has neokinetic connections, and serves acquired movements of dexterity as in the development of the hand.

The author describes in detail experimental investigations, operations, pharmacological, electrical, and mechanical modes of influencing or irritating, and the action currents of the cerebellar cortex, and discusses Barany's theory of tonus centers in the cerebellum. He comes to the conclusion that in the mammalian and therefore in the human cerebellum, three regions are to be distinguished: (1) the anterior lobe, pyramid, and uvula, which exert a regulating influence on the tonus of the extremities, (2) the flocculus, lingula, and nodulus, constituting the vestibular projection region, and (3) the median lobe, which contains centers determining the tonus of definite groups of muscles. JÄNSCH (O).

Čugonov, I.: Complications of Pneumocephalography (Ueber Komplikationen bei der Pneumocephalographie). *Vestnik. Chir.*, 1930, xli, 39.

Severe headache occurs in the majority of cases in which pneumocephalography is done; vertigo is relatively rare. It is peculiar that these phenomena are least pronounced in persons suffering from apoplexy, paralysis, epilepsy, or syphilis of the brain. Frequently there are disturbances of consciousness which in some instances go as far as coma. In about half of the cases the pulse is slow; more rarely, it is rapid. The blood pressure is usually reduced; infrequently it is increased. Only in cases of brain tumor are decreases and increases in the blood

pressure noted with about equal frequency after pneumocephalography. The unpleasant symptoms appear to be lessened by the subsequent withdrawal of from 20 to 40 c. cm. of cerebrospinal fluid or of about 30 c. cm. of air. As a late complication, appearing on the evening of the day of the cephalography in three-fourths of the author's cases there was a rise in the temperature which usually reached 38 degrees C. Others have reported temperature elevations up to 40 degrees C. These are followed by spasm of the neck, Kernig's sign, and hyperaesthesia of the skin. Vomiting and disturbances of micturition appear to be unusual. In his last 32 cases the author was able to determine regularly a considerable leucocytosis in the cerebrospinal fluid, which attained a maximum of 115 cells per cubic centimeter. Globulin reactions (Nonne, Apelt, and Pandey) were positive in 60 per cent and the brain pressure was increased in 80 per cent of the cases.

The early complications are probably ascribable to the variations in the brain pressure which are unavoidable when the cerebrospinal fluid is replaced with air and cause disturbances in the blood supply and metabolism of the brain. Fatalities after pneumocephalography are not very rare, but up to the present time a statistical collection of the deaths does not seem to have been published. Dandy had 3 fatalities in his first 100 ventriculographies, whereas in several hundred which he performed later no deaths occurred. Bingel reported 2 deaths in 300 cephalographies; McConnell, 2 deaths in 9; Denk, 7 deaths in 67; and Juengling, 8 deaths in 60. The author had 2 deaths, both in cases of brain tumor. From the literature he collected a total of 53 deaths, the greater number of which occurred in cases of brain tumor. Tumors of the posterior cranial fossa appear to be most dangerous. The author holds pneumocephalography to be contra-indicated in cases of tumor of the posterior cranial fossa, cases of brain tumor in which there are attacks of vertigo, and cases of still active acute and subacute inflammatory processes in the brain. N. PETROV (Z).

Linthicum, F. H., and Rand, C. W.: Neuro-Otological Observations in Concussion of the Brain. *Arch. Otolaryngol.*, 1931, xlii, 785.

Cerebral concussion often occurs under circumstances which give rise to a claim for compensation. The differentiation between organic and psychogenic post-concussion symptoms is extremely difficult as most of the complaints are unassociated with objective findings revealed by routine physical and neurological examinations. As vertigo is an extremely common symptom, Linthicum and Rand undertook a careful study of thirty-five cases to determine whether there is any correlation between this symptom and changes to be observed in the course of neuro-otological examinations. Such a correlation was demonstrated in nearly all of the cases. Most of the changes were suggestive of mixed central and end-organ damage or of central damage alone. The authors considered as evidence of central involve-

ment the frequent occurrence of a marked decrease or even absence of past-pointing after stimulation in the presence of hyperactive nystagmus; the induction of perverted nystagmus; the infrequent occurrence of spontaneous past-pointing and nystagmus; postural nystagmus; postural vertigo, that is, attacks of dizziness with the head in certain positions, frequently noted without a simultaneously occurring nystagmus; the rare correspondence of spontaneous disturbances in equilibrium ascribed by the patient to the vertigo produced by artificial stimulation of the labyrinth; severity of the symptoms out of all proportion to the degree of the spontaneous phenomena; and marked vestibular derangement in the presence of normal or only slightly impaired hearing.

The following conclusions are drawn:

1. In practically all cases of cerebral concussion complaint is made of an equilibratory disturbance.
2. The disturbance of equilibration may be manifested by an abnormality in the neuro-otological observations.
3. These observations are usually indicative of mixed central and end-organ damage rather than involvement of the end-organ alone.
4. The most constant observations are abnormalities in the past-pointing reactions.
5. Traumatic equilibratory disturbances arising in the end-organs are more apt to readjust themselves than those of central origin.
6. Postconcussional vertigo should not be regarded as of psychogenic origin until it has been checked by neuro-otological tests.
7. Postconcussional vestibular tests may entirely or partially simulate those found in the syndrome of tumor of the cerebellopontine angle.

LEO M. DAVIDOFF, M.D.

Peritz, G.: The Fate of Persons with Brain Injuries (*Ueber das Schicksal der Gehirnverletzten*). *Med. Klin.*, 1931, 1, 24.

This article is a collective review.

Isserlin reckons the number of cases of war injuries of the brain in Germany at more than 25,000. In contrast to war injuries of other parts of the body, brain injuries are not helped by time. This is evident from the investigations of Baumm and from the report of Credner on the fate of 1,990 veterans with brain injuries who were treated in Heck's Institute of Neurological Therapeutics and Research in Munich. Of 1,193 patients, Credner found that 244 (20.5 per cent) showed improvement, 281 (23.5 per cent) showed no improvement, and 668 (56.6 per cent) were worse.

The mental sequelæ of brain injury include disturbances of attention and memory. Injuries to the front brain lead to dullness, apathy, abulia, and akinesia, and oscillations of mood between euphoric facetiousness and melancholic depression. Among psychic disturbances Credner lists schizophrenia, schizoid traits, cyclic depressions, melancholy, euphoria, hypomania, lack of incentive, lack of inhibition, paranoid delusions, and changes in person-

ality in the direction of psychopathy and hysteria. Among the consequences of disturbances of the sympathetic nervous system are hyperamia, attacks of sweating, palpitation of the heart, vertigo, a sense of oppression; genital atrophy, adiposity, and marasmus. The most important sequela of brain injury is traumatic epilepsy. In its pronounced attacks it is easily recognizable, but in its equivalents its diagnosis frequently offers great difficulties.

The author reviews also the work of Foerster and Penfield which is of interest particularly from the standpoint of surgery. As early as 1925, Foerster called attention to the dilatation and displacement of the ventricles by the traction of dural cicatrices in persons who had suffered brain injuries. Foerster and Penfield found that in patients suffering from traumatic epilepsy an epileptic attack could be brought on by traction with the forceps on the dura in the region of adhesions. Therefore Foerster excises the cicatricial connection between the dura and the ventricles. In 12 cases of traumatic epilepsy operated upon in this manner excellent results were obtained.

Neustadt's work indicates the importance of an increase in the pressure of the cerebrospinal fluid as a cause of headache, vertigo, and psychic disturbances. As a rule psychic disturbances in persons with brain injuries should be recognized as accident sequelæ.

The author reviews also the work of Voss and Meyer on skull injuries. W. MANDEL (Z).

Carmichael, E. A.: The Etiology of Disseminate Sclerosis: Some Criticisms of Recent Work, Especially with Regard to the "Spherula Insularis." *Proc. Roy. Soc. Med.*, Lond., 1931, xiv, 591.

Early in 1930, Chevassut claimed that she had isolated a virus, "spherula insularis," from cultures of the spinal fluid in disseminate sclerosis. The author has checked her work with regard to: (1) the Lange gold-sol curve, (2) the levulose-tolerance test, (3) the variation in the pH of cultures, and (4) the microscopic appearance of cultures.

The Lange gold-sol curve was studied in carefully selected cases of acute, progressive, and stationary disseminate sclerosis with solutions made by Greenfield. The findings showed that the character of the curve did not correspond to the stage of the disease. In only 31.9 per cent of ninety-four cases was there a curve of 3 or over. In two previous series of determinations made by the author and Greenfield with different solutions, a curve of 3 or over was obtained in 30.5 and 33.7 per cent respectively. Chevassut's percentage was 54. The author explains the difference by assuming that Chevassut's solutions were too sensitive.

The levulose-tolerance curves were studied in a series of cases treated at St. Bartholomew's Hospital and a series treated at the National Hospital, London. In both series the levulose used was 95 per cent pure. Hagedorn's method of blood-sugar estimation was employed. In only six of twenty-

eight cases was there a rise of over 30 mgm. in the blood-sugar level, whereas of Chevassut's cases over 70 per cent showed a rise of 70 mgm. or more. To explain these great differences Carmichael assumes that Chevassut used less pure levulose or that previous arsenical therapy disturbed the function of the liver in his cases.

For the study of the pH of the cultures, Carmichael chose the close-cell electrode whereas Chevassut employed a bubbling electrode. In all of the author's determinations Hartley's broth was used and the proportions and dilutions were the same as those reported by Chevassut. However, there was a considerable discrepancy between the results in the two series. Chevassut reported the pH stationary or slightly acid (7.6 to 7.4) whereas the author noted a definite tendency toward alkalinity (8.0 to 8.2 or 8.4) no matter how the mixture of broth and serum was prepared. He attributes the tendency toward alkalinity to the loss of carbon dioxide. As the culture methods were different, the results cannot be compared.

In the study of the microscopic appearance of the cultures, which was made according to the method reported by Chevassut, no spherules were found in nineteen fluids of disseminate sclerosis examined. Of another series of fluids from cases of various diseases, spherules were found only in the fluid from a case of chorea.

In the discussion of this report, SIR PURVES-STEWART stated that the discrepancy in the results of the two investigators were due to the difference in the methods used and were not serious. He believes that the gold curve is a concomitant phenomenon; that a positive curve does not necessarily prove the presence of a virus and may be due to the toxin of the causative agent. In the absence of a co-existing excess of indican in the urine and negative glycuronic acid tests, positive levulose-tolerance findings are of little value as an indication of deficient liver function. These tests were not carried out by Carmichael. The pH determinations made cannot be compared as each investigator used a different type of hydrogen electrode. Chevassut's finding of spherules in fluids of disseminate sclerosis has been corroborated by Smith, Ransom, and Terkowitz. Her positive findings in 93 per cent of a series of 176 cases and in 89 per cent of a series of 234 cases must be given consideration. The chief clinical questions are:

1. Are the spherules specific to the disease?
2. Are they a vital phenomenon or a biochemical reaction?
3. Are filterable viruses living organisms?
4. Is it possible to prepare a vaccine from the spherula which will be beneficial therapeutically, and if so, how?

CHEVASSUT stated that Carmichael had misquoted her with regard to some of her findings, and that some of the differences in his findings were due to his failure to carry out the details of the study as described by her. ALBERT S. CRAWFORD, M.D.

Martin, J. P.: Chronic Subdural Hæmatoma. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 585.

Martin applies the term "chronic subdural hæmatoma" to a collection of blood between the dura and arachnoid which has become encysted. In former years this condition was rare except in asylum patients. In the latter it was found frequently and was known as "pachymeningitis hæmorrhagica." In 1914, Trotter reported four cases in which he had operated. In 1925, Putnam reviewed a number of cases reported by American surgeons. Since then, many cases have been reported. The condition may be considered uncommon but not rare. The author reports three cases of his own and three from the records of the National Hospital, London.

The pathogenesis of the condition is not clear. The most satisfactory theory is that the bleeding comes from a tear caused by the sudden trauma of a blow or a fall in a small vein passing from the surface of the brain to the dura.

The hæmatoma occurs most frequently in the frontal and parietal region. In 40 per cent of the cases it is bilateral. The two enclosing membranes, one from the dura and the other from the arachnoid, can usually be detached easily. They consist of fibrous tissue with numerous blood vessels and spaces. It has not yet been decided whether the membranes are the cause or the result of the hæmorrhage. There appears to be evidence of both active bleeding and absorption of blood. The enlargement of the hæmatoma is usually so gradual that the symptoms are delayed until the local compression becomes too great.

The condition occurs about five times more frequently in males than in females and is most common after the age of forty years. In the cases of older patients the trauma responsible is often very trivial or no history of trauma can be elicited. Alcoholism may be a predisposing cause. Bilateral lesions usually occur in persons over fifty years of age and may result from very slight trauma.

The clinical course has two stages, a latent period and a period of symptoms. The latent period is shorter the more severe the trauma. As a rule it lasts for several weeks, but in some cases it has exceeded a year. The symptoms are at first general and finally lead to coma. The focal symptoms are late and partial. Ocular signs are common.

Two of the author's cases are reported in detail. One was that of a physician fifty-two years of age who had had headaches for six months. Ultimately the headaches became associated with drowsiness and defective memory. Diplopia developed. On lumbar puncture the cerebrospinal fluid pressure was found to be low and the cerebrospinal fluid to be normal. The next day the patient became partly unconscious. Neurological examination disclosed a right hemiplegia. The loss of consciousness became progressively deeper and the patient died on the eleventh day after he was first seen.

Mental changes, drowsiness, and headache which are variable and rapid in progress without other

tumor, the operation was followed by cure in 4 and by death in 3. In 2, it was performed only recently. Of 7 operations for "cysts" or meningitis serosa circumscripta, 2 resulted in almost complete cure, 1 in improvement, 3 in no improvement, and 1 in death. In a case of vertebral enchondroma, operation was followed by improvement, but three years later a severe recurrence developed. In cases of vertebral tumor, including metastatic neoplasms, decompressive laminectomy is indicated for relief of the pain and the compression of the cord even when the condition is hopeless.

The diagnosis of tumor of the spinal cord must be made by the neurologist. Early operation is important. Some of the important diagnostic methods may be used by the surgeon, particularly lumbar puncture with a study of the spinal fluid and myelography. The normal pressure of the cerebrospinal fluid is from 10 to 12 mm. Hg, the fluid on the puncture coming in drops of about 60 per minute. When the drops come at the rate of 100 per minute there is a slight increase in the pressure; when the fluid flows in a continuous stream, the pressure is high; and when the fluid shoots out in a spurt, the pressure is very high. If these facts are borne in mind, manometer readings are unnecessary. When the free circulation of the fluid is hindered, xanthochromia appears and the Nonne-Appelt reaction becomes positive although the cell count may show very little change and neutrophilia may be absent. The Queckenstedt sign and the syndrome of Froin should be watched for; also changes in the protein fractions in the fluid in the sense of an increase in the globulin and the appearance and increase of albumin in cases of tumor. Myelography is of great aid. For this procedure the author employs lipiodol. By this method the diagnosis was confirmed in many instances. In contradistinction to Sharp, Nazarov has noted no disturbances from residual drops of lipiodol. When the diagnosis is not confirmed, exploratory laminectomy is necessary. In cases of trauma with compression of the cord, the earliest possible operative interference is demanded.

K. KORNLMANN (Z).

Watts, J. W., and Mixer, W. J.: Spinal Epidural Granuloma. *New England J. Med.*, 1931, cciv, 1335.

The authors report four cases of epidural granuloma.

From a study of their own cases and a review of the literature they conclude that the condition should be regarded as a clinical entity. The syndrome is characterized by signs of cord compression, pain, spinal subarachnoid block, fever, and a definite lymphocytosis of the spinal fluid. Syphilis and tuberculosis must be ruled out.

The four cases reported were treated by laminectomy with partial removal of the mass, decompression, and drainage. The operation resulted in improvement in only two of the cases.

LEO M. DAVIDOFF, M.D.

Elsberg, C. A.: The Extradural Ventral Chondromata (Echondroses), Their Favorite Sites, the Spinal Cord and Root Symptoms They Produce, and Their Surgical Treatment. *Bull. Neurological Inst. New York*, 1931, 1, 350.

Ventral chondromata (echondroses) are slowly growing primary extradural tumors which are not at all rare. They were found in 14 per cent of the author's last 100 cases of spinal tumor and constituted 36 per cent of the extradural growths. Their most common sites are the cervical and lumbar intervertebral cartilages. They occur more frequently in males than in females.

The clinical history is that of compression of the cord on its anterior aspect with definite motor disturbances, cutaneous sensory loss with relatively little involvement of tactile sensibility, preservation in most instances of vibratory and muscle-joint-tendon sense, and relatively infrequent involvement of the sphincters of the bladder and rectum. Subarachnoid block is much more uncommon, and the globulin, and particularly the total protein values, in the spinal fluid, are considerably less, than in cases of tumors of other types compressing the spinal cord. Roentgenograms of the spine rarely show evidences of the growth.

The combination of symptoms and signs, the results of the manometric tests and spinal fluid examinations, and the negative X-ray findings should make a correct diagnosis possible in many instances.

The growths are usually small and derived from the posterior border of an intervertebral cartilage. They can be best exposed by a bilateral laminectomy with incision of the dura and mobilization of part of the spinal cord by division of 1 or more slips of the dentate ligament. In the majority of cases removal is best accomplished by a transdural method, but when the growth is in the lumbar region, an extradural approach is sometimes preferable after the exact site of the tumor has been determined by intradural exploration.

Removal of the tumor was followed by satisfactory results in almost one-half of the cases reviewed and by improvement in about one-third. In 2 cases in which there were advanced cord disturbances before the operation there was no improvement. With earlier recognition of the growth, the results of surgical treatment should be as good as those of operations for spinal compression by benign intradural tumors and extradural tumors of other types.

DAVID JOHN IMPASTATO, M.D.

SYMPATHETIC NERVES

Dandy, W. E.: The Treatment of Hemigranias (Migraine) by Removal of the Inferior Cervical and First Thoracic Sympathetic Ganglion. *Bull. Johns Hopkins Hosp.*, Balt., 1931, xlviii, 357.

Dandy reports two cases of migraine. The first was that of a man of fifty-one years who suffered attacks of severe pain in the right side of the head which were accompanied by homolateral ptosis,

sweating of the face, photophobia, congestion of the conjunctiva, swelling of the mucous membrane of the nose, fullness of the vessels of the face, and sometimes bradycardia (40-50). On October 28, 1930, the homolateral stellate and inferior cervical ganglia were removed by the Adson technique. Up to May 1, 1931 (six months after the operation), there had been no return of the pain.

The second case was similar to the first, but the pain was on the left side. An operation for removal of the homolateral superior cervical ganglion failed to give relief. A week later, February 18, 1931, the inferior cervical and first thoracic sympathetic ganglia were removed. Up to the time this report was written, three months after the operation, the patient was free from pain.

The author is unwilling to draw conclusions on the basis of only two cases and after so short a time, but believes that the treatment described is promising.

LEO M. DAVIDOFF, M.D.

Young, A.: The Place of Periarterial Sympathectomy and of Ganglionectomy and Sympathetic Trunk Resection in the Treatment of Certain Vascular Diseases and Other Conditions.
Glasgow M. J., 1931, cxv, 273, cxvi, 1.

The author discusses the surgery of the sympathetic nervous system and reports cases which he has treated by periarterial sympathectomy or ganglionectomy and resection of the sympathetic trunk.

He obtained good results from periarterial sympathectomy in two cases of chronic varicose ulceration of the leg. He attributes the favorable effect of the operation on this condition to the active hyperemia produced which accelerates the tissue growth, the local fixation of large mononuclear cells which play an important part in connective tissue repair, the active leucocytosis and phagocytosis consequent upon the operation, and the rapid disinfection and sterilization of the wound which follow the local physiological reactions.

In two cases in which he performed periarterial sympathectomy to promote bone growth, the operation was without beneficial effects. One was a case of delayed union of a fractured tibia, and the other a case of Charcot's disease of the knee joint in which, following resection of the joint, bony synostosis could not be obtained. He believes that sympathectomy is merely an adjuvant which may promote local activity and help the process of bone repair.

In a case of obscure injury to the knee joint resulting in marked disability and in a case of destructive osteo-arthritis of the left ankle and tarsal bones periarterial sympathectomy was followed by complete relief of the pain and restoration of function.

Causalgias due to associated injury to adjacent arterial and nerve trunks are greatly modified and may frequently be cured by periarterial sympathectomy. However, the operation must be combined with free excision of scar tissue and appropriate

treatment of the associated nerve injury. Leriche advocates resection of injured arteries which have been obliterated.

Periarterial sympathectomy may be of value in true contractures without definite or considerable necrotic change, but little can be expected from it in cases of Volkmann's contracture. The author cites good results reported from it in the treatment of gangrene of the extremities. In many cases of this condition the pain is relieved and localization of the gangrenous process is favored so that amputation may be performed at a level lower than would otherwise be possible. A limited gangrene of the toe of vascular origin, either Raynaud's disease or obliterative arteritis, was definitely benefited by periarterial sympathectomy.

Periarterial sympathectomy may be of value in a certain group of conditions in which simple injury such as a direct blow on the arm, leg, hand, or foot without obvious damage to bone or gross injury to soft tissues is followed by the development of a hard brawny oedema which does not readily disappear and may become associated with a varying degree of disability. A good result was obtained from periarterial sympathectomy in a case of severe recurring traumatic oedema of the leg. Some benefit was obtained from it also in a case of spasm following a central hemorrhage.

The author reviews the various operations for ganglionectomy. He obtained a good result from a right lumbar ganglionectomy and a left cervico-thoracic ganglionectomy in a severe type of Raynaud's disease in a young woman. The other sides are to be operated upon later. The extremities on the side of the ganglionectomy have remained normal in color, warm, and free from spasm.

Young believes that a limited group of diseases affecting the arterial walls, such as arteriosclerosis and calcareous degeneration, may be benefited by ganglionectomy. A good result was reported following lumbar ganglionectomy in a man fifty-nine years old with extreme calcification of the iliac artery and arteries of the limbs with intermittent claudication. Improvement followed ganglionectomy in a woman with extreme widespread thrombo-angiitis obliterans.

The author reviews also the treatment of retinitis pigmentosa and certain joint conditions. He obtained satisfactory results from resection of the sympathetic nerves to the distal part of the colon and rectum in a case of Hirschsprung's disease. He reviews the present status of surgical treatment of "cord bladder" by resection of the presacral nerve.

ROBERT ZOLLINGER, M.D.

MISCELLANEOUS

Heymann, E.: Surgical Interventions in Painful Conditions (Chirurgische Eingriffe bei Schmerzzuständen). *Zentralbl. f. Chir.*, 1931, p. 395.

The operative extirpation of pain-conducting fibers has proved no more effective than the destruc-

tion of such fibers with alcohol. As the pain often originates nearer the central organ or in the central organ itself, division between the intervertebral ganglion and the center and, in severe trigeminal neuralgia, retroganglionic division are the best methods of treatment. Not resection of the ganglion, but retroganglionic division is therefore to be preferred. By the latter procedure the author was able to cure forty-six of forty-eight patients. Two patients who were over seventy years of age died from exhaustion.

Heymann favors sympathectomy according to the method of Leriche. In several cases, by separating the main artery from adhesions and excochleating the periarterial tissue, he was able to give relief from severe pain which previously had been uninfluenced even by neurolysis. He had successful results also in cases of accidents from intravenous infusions. In such cases the removal of cicatrices from the median nerve was of no avail, but the freeing of the artery from its sympathetic plexus was beneficial.

The only point where the sympathetic fibers unite is the stellate ganglion; in all other parts of the body

the sympathetic paths are so ramified and so much connected that a shunting out of certain areas is impossible. If the stellate ganglion is shunted out, the sympathetic conduction of pain in the arm is completely prevented. The sympathetic pain fibers course from the wall of the subclavian artery and the aortic arch to the ganglion which consists of two elongated club-shaped thickenings and are connected again by a few thread-shaped offshoots. There is also a connection with the inferior cervical plexus. To divide the pain fibers it is sufficient to divide the connections between the cervical roots and the stellate ganglion. The ganglion itself, which has a regulating effect upon the heart action, should be left intact. Severe painful conditions in the arm can be relieved in this way. It is characteristic that the pains are not limited to segmental regions, but change their location. The hand becomes blue, dull pressure is noted in the fingers, and there is a lively secretion of sweat. The splitting of the spinal cord in the posterior longitudinal groove according to the method of Greenfield has not proved successful.

VOGELER (Z).

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Reinecke, H.: Follow-Up Studies of the Clinical Results in Cases of Breast Tumor Diagnosed During the Period from 1915 to 1928 (*Nachuntersuchungen ueber die klinischen Ergebnisse der in den Jahren 1915-1928 diagnostizierten Mammatumoren*). *Zentralbl. f. Gynaek.*, 1931, p. 213.

The author reviews 137 cases of breast tumor in 99 of which a diagnosis of carcinoma was made. The carcinomata included the solid, scirrhus, and adenomatous types. In the follow-up study it was found that 78 of the patients with carcinoma were dead and 21 were cured. In 14 of the cured cases the carcinoma was of a nodular form and in 2 of these there were metastases in lymph nodes. In 7 of the cured cases the carcinoma was of the diffusely infiltrating type, and in 1 of these there was a metastasis in a lymph node.

The influence of age on the healing of carcinoma may be disregarded since the ages of the patients who recovered averaged fifty and one-tenth years and the ages of the patients who died averaged forty-seven and seven-tenths years.

A comparison of the healed cases shows that the morphological variation of the malignant epithelial proliferation is of relatively little prognostic significance. Of the benign breast tumors, a considerable difference was noted between adenofibromata and fibro-adenomata. A diagnosis of adenofibrosis of the breast was made only when fatty tissue was found in a generally adenofibrotic structure of the tumor. The term "fibrosis of the breast" was chosen when firm connective tissue interspersed in part with loose connective tissue and in part with fatty tissue dominated the field with a few gland acini.

Of the 38 patients with benign changes of the breast, 33 are well and 5 are dead. Of the 5 who are dead, only 1 died of carcinoma of the breast after a diagnosis of mastitis. Re-examination of the histological section made in the case of the latter patient revealed unquestionable hemorrhagic mastitis. If the reported cause of death was correct, there remains only the possibility that cancer of the breast developed later or that the carcinomatous portion was overlooked and a benign portion of breast tissue was examined. The longest time since the treatment in the healed cases is fifteen years, and the shortest time one and a half years.

In some cases the histological diagnosis is very difficult. The adenomatous proliferation even in the circumscribed adenofibromata, and particularly in the diffuse adenofibroses, goes over unexpectedly into carcinoma in individual places. Therefore it must be left to the clinician to decide whether a simple excision or a more extensive operation should be done.

F. T. MEYER (G).

Lee, B. J.: Carcinoma of the Breast in the Young. *Arch. Surg.*, 1931, xxiii, 85.

In a statistical survey of 2,663 patients with cancer of the breast, Lee found that approximately one-sixth were under forty years of age. Two-thirds of the women had previously lactated. The diagnosis was difficult and pre-operative diagnostic errors were common. The tumor was situated in the upper outer quadrant of the breast in 28 per cent of the cases and in the upper inner quadrant in 20 per cent.

In operable cases irradiation should be followed by radical amputation. When the first sign is diffuse enlargement of the breast, redness overlying the mammary gland, or pain, surgical intervention is often futile. The course is often exceedingly rapid, almost simulating that of an infectious process.

In young women, cancer of the breast is a much more menacing disease and its early recurrence is more frequent than in older women.

J. DANIEL WILLEMS, M.D.

De Quervain, F., Châtenay, G., Zisman, M., Rieder, H., and Haemig, E.: Statistics on Breast Cancer in Switzerland from 1911 to 1915. Reports of Swiss Society for the Control of Cancer. 1930: Berlin, Huber.

DE QUERVAIN presents a brief foreword as to the contents. This volume is the last of the publications concerning the statistics of cancer of the breast in Switzerland from 1911 to 1915. It contains four articles.

CHATENAY discusses the statistics with regard to morbidity. The statistics are presented with special reference to age. Fifty-four per cent of the women operated upon for breast cancer were of middle age, fifty-two and forty-nine hundredths years, whereas the average age of those not operated upon was sixty and seventy-five hundredths years. The observations show that the malignancy of the tumor is inversely proportional to the age at which it appears. If the breast is affected with carcinoma while it is still functioning the condition is more serious than if it appears later.

ZISMAN discusses the etiological rôle of heredity, trauma, inflammation, pregnancy and lactation. His remarks on the neoplastic reaction are in accord with those of De Quervain. It was noted that the carcinomatous disease appears relatively frequently in conjunction with mastitic processes.

RIEDER reviews the pathologico-anatomical results of the total material with special attention to the dissemination of the cancer cells. The theory that latent cancer cells are responsible for late recurrences and metastases was found to be the most rational view in the present state of our knowledge. It is considered possible that an oper-

active intervention may indirectly affect these cells by activating them from a distance. Carcinomatous emboli in the lungs were demonstrated microscopically. Handley's theory that the blood stream is of far less importance than the lymph stream in metastasis does not explain everything, for the bone, lung, and liver metastases are carried, chiefly through the blood stream. We do not know the time of dissemination of cancer cells (Schmidt), but the possibility of permanent cure, even in the presence of small, distant metastases, is emphasized.

In the last article, De Quervain attempts to show that, in spite of their shortcomings, statistics give us a clearer conception of the achievements of medical skill in the treatment of cancer. The management of recurrences constitutes a special problem. The optimistic surgeon thinks that occasionally the removal of isolated distant metastases may be of value. Whether, and how far, we are justified in applying the conclusions based on breast cancer to other carcinomata cannot be determined, and it remains for the future to reveal the extent to which improvement of irradiation technique will affect the results. W. RUERSAMEN (G).

TRACHEA, LUNGS, AND PLEURA

Connors, J. F.: The Treatment of Lung Abscess and Empyema by Packing. *Ann. Surg.*, 1935, xciv, 38.

In the procedure described by the author the patient is placed on the unaffected side with the chest resting on a small pillow and the arm drawn over the head. If the empyema is localized, the incision is made over the dependent portion. As a rule the empyema is diffuse and a 4-in. incision is made parallel with the ribs along the eighth interspace in the subscapular region. Approximately $2\frac{1}{4}$ in. of the eighth and ninth ribs are resected subperiosteally. The intercostal vessels and muscles are ligated and removed *en masse* for a distance corresponding to the length of the ribs resected.

Exudate is located with an aspirating needle and a grooved director then plunged along the needle. The opening is enlarged to admit the tip of an aspirating apparatus and as much exudate as possible is removed. The pleura is opened. Violent coughing and dyspnoea are controlled by manually closing the opening into the pleural cavity. Large masses of fibrin, if present, are removed with forceps. Communicating intrapleural cavities are made into one cavity by manually breaking down adhesions.

The cavity is tightly packed with iodoform gauze which has been washed and wrung out. The packing is begun at the apex and care is taken to fill in the sulcus between the lung and parietal wall. The skin wound is laid wide open.

The packing is removed from one to four days after the operation. In the postoperative care the patient is instructed to cough vigorously to aid in expanding the lung. Blow bottles are also used. After the first dressing the wound is packed loosely

or not at all. No subsequent tubes or irrigation are used. The large orifice is allowed to close until it is approximately $\frac{3}{4}$ in. in diameter. The patient is propped up in bed and as soon as his condition permits is allowed to get up. Fluids are given by mouth and intravenously.

Forty patients ranging in age from two to seventy-one years have been treated by this method. Ten died. Two of those who died had chronic pulmonary tuberculosis. One died of shock and cardiac failure. Three of those who died had a bacteremia before the operation.

The author objects to packing because too tight and re-applied packings may produce a chronic sinus. The pulse may be accelerated 20 or more beats per minute, but may be reduced by releasing the pressure. An infection of the opposite lung may be considered a contra-indication.

The following advantages are claimed for the treatment described:

1. The pleural cavity is cleaned in twenty-four hours.
2. The postoperative management is easy.
3. Tubes and irrigation are unnecessary.
4. The discomfort of a mobile mediastinum is eliminated.
5. The large thoracotomy wound with the aid of a Cameron light permits perfect inspection of the pleural cavity.

EARL O. LATIMER, M.D.

Langeron, L., and D'Hour, H.: Six Cases of Acute Gangrenous Abscess Treated Medically (Documents iconographiques concernant l'évolution de six abcès gangréneux aigus traités médicalement). *Arch. méd. chir. de l'appar. respir.*, 1930, v, 508.

The authors report six cases of acute gangrenous abscess of the lung which were treated with arsenobenzol. In the most serious cases anti-gangrene serum was used in addition. The authors conclude from their results that this treatment is indicated in many cases of acute gangrenous abscess of the lung. In only one of the ten cases they have treated was there a distinct indication for surgery.

The arsenobenzol was given in doses of from 0.15 to 0.30 gm. which were repeated every two or three days. The authors believe that small and frequently repeated doses are better than larger doses administered at longer intervals. They give the anti-gangrene serum in doses of 40 c.cm. only during the acute period. Sometimes a repetition of the arsenobenzol treatment is necessitated by recurrence.

AUDREY GOSS MORGAN, M.D.

ÆSOPHAGUS AND MEDIASTINUM

Wiethe, C.: Perforation of the Æsophagus Caused by Æsophagoscopy (Ueber Oesophagusperforationen hervorgerufen durch Oesophagoskopie). *Ztschr. f. Hals-, Nasen-, u. Ohrenheilk.*, 1930, xxvii, 58.

Wiethe points out the dangers of æsophagoscopy. While the majority of the accidents are experienced

by the unskilled examiner, serious and even fatal complications may result even when the examination is made by an experienced examiner. Even the smallest lesions of the mucosa may be fatal. The various possibilities are discussed on the basis of cases from the Vienna clinic.

The injuries produced are classified as penetrating wounds of the œsophagus with a fatal outcome and non-penetrating lesions of the mucosa with a fatal outcome or followed by recovery. The injury usually occurs in the region of the cricoid. It is not to be wondered at that a suppurative mediastinitis develops after penetrating injuries, but it is surprising that a rapidly progressing mediastinitis terminating fatally occurs after injuries to the mucosa in which the muscle remains intact. The most important sign of a tear in the mucosa is the appearance of stretched-out connective tissue fibers in the bottom of the lumen of the œsophagus as visualized by the œsophagoscope. The perforation may be so well closed by the second day that it can no longer be found and one looks in vain for the point of origin of the mediastinitis which has developed.

The œsophagus always tears in its long axis. In the absence of choking movements and spastic contractions, no injury occurs. When this resistance was excluded by anesthesia in the author's experiments on animals, injury was impossible even when considerable force was used. **MAYER (H).**

Lotheissen, G.: The Diagnosis and Treatment of Diverticulum of the (Esophagus) (Diagnose und Behandlung der Divertikel der Speiseröhre). *Klin. Wchnschr.*, 1931, i, 73.

Especially in the early stages, diverticula occurring at the juncture of the pharynx and œsophagus, known also as border diverticula, do not produce very characteristic symptoms. However, the presence of a diverticulum of this type should be suspected in the cases of patients with frequent expectoration of tenacious mucus, irritation of the throat, a desire to cough, a sense of pressure following the ingestion of solid food, the ejection of food, and nausea. A carefully taken history will often lead to the correct diagnosis. If an examination is made with a sound, a sound with the tip curved as in a Mercier catheter should be used. The best diagnostic procedure is fluoroscopic examination.

A cure can be obtained only by surgical treatment. If this is refused, dilatation may give good results. Only when the general condition is very poor is it advisable to establish a preliminary gastric fistula. Total extirpation of the sac is the best means of obtaining a permanent cure. The various methods are described. In 60 cases in which a 1-stage operation was done the mortality was only 1.66 per cent, whereas in 191 cases treated non-surgically, there were 23 deaths from starvation or a pulmonary complication due to aspiration. Deep diverticula are often associated with cardiospasm, but the symptoms cease rapidly as a rule after suitable treatment of the œsophageal spasm by dilatation. On account

of their great danger, operative interventions should be carried out only when the disturbances are very severe. Traction diverticula become dangerous when they rupture into a neighboring organ.

A. BRUNNER (Z).

Bessesen, D. H., and Bessesen, A. N., Jr.: Surgical Treatment of Carcinoma of the Thoracic (Esophagus). *Am. J. Surg.*, 1931, xli, 437.

The mortality of carcinoma of the thoracic œsophagus is 100 per cent unless the growth is completely removed surgically. Operation is difficult because of the inaccessibility of the organ; its anatomical relations and structure; the absence of a serous coat and the poor blood supply which favor necrosis and the development of postoperative infection in the neck, mediastinum, pleura, and lung; the proximity of the vagi; the presence of the diaphragm, which prevents approach from below; and the high malignancy of carcinoma of the œsophagus.

All methods of approaching the thoracic œsophagus are either the extrapleural or the transpleural type. Torek's transpleural operation has been successful three times. Regardless of the method used, a preliminary gastrostomy is necessary and the general condition of the patient must be built up.

The authors report a case operated upon by Torek's method after the preliminary induction of a closed pneumothorax. Pneumothorax permits rapid opening of the thorax without danger of shock. The authors' patient lived three days after the operation and died of an infection of the left pleura and the mediastinum.

Six recognized causes of death from operation for carcinoma of the thoracic œsophagus are:

1. Shock from opening of the thorax. This may be prevented by preliminary closed pneumothorax.
2. Surgical shock. This is influenced by preliminary narcosis and the type of anæsthetic used.
3. The dissection. If the vagi cannot be saved they should not be sectioned above the fifth thoracic vertebra.
4. Infection of the pleura and mediastinum.
5. Infection of the lungs. Eggers suggests forceful inflation of the lungs after operation. Air should be aspirated from the chest postoperatively to stimulate function in the collapsed lung.
6. Recurrence of the carcinoma. Total excision of the growth is essential. Carcinoma of the œsophagus rarely metastasizes. **EARL O. LATIMER, M.D.**

Herzberg, B.: The Anatomy of the Abdominal Portion of the (Esophagus) and Its Operative Approach (Die Anatomie des Bauchabschnittes der Speiseröhre und die operativen Wege zu demselben). *Z. sovrem. Chir.*, 1930, v, 860, 1098.

This article is based upon ninety-five operations on twenty-five cadavers, repeated operations on twenty-two animals, and studies on patients operated upon in the Hesse Clinic.

The length of the abdominal portion of the œsophagus varies from 0.5 to 4 cm. In one case the abdominal portion was absent entirely. In women it is relatively shorter than in men. In dolichomorphs it is longer (1.72 cm.) than in brachymorphs (1.53 cm.) or mesomorphs (1.56 cm.). The transition of the abdominal portion of the œsophagus into the stomach is of two types. In one, the incisura cardiaca has a considerable depth and an acute angle of 30 degrees. In the other, the depth of the incisura cardiaca is slight and the angle about 180 degrees. Between these two types there is a series of intermediate forms.

The innervation through the vagus may be a heavy network or poorly developed. Sympathetic fibers coming from the arterial trunks or as isolated fibers are interwoven with the vagus.

The author prefers Kocher's angular incision of the abdominal wall with, when necessary, temporary resection of the costal arch from within. In the cases of broad-chested persons the Kocher incision gives free access to the abdominal œsophagus. In the cases of narrow-chested persons the operation cannot be performed through the abdominal in-

cision. To facilitate the operation, the author places a cushion under the lower thoracic portion of the vertebral column. By this means the operative field is made 3 cm. shallower and the hepatic coronary ligament is deeply indented. Often the removal of the xiphoid process of the sternum clears the field. Liberation of the œsophagus into the abdominal cavity is possible up to 5 cm. without division of the vagi and as far as 7.5 cm. with division of the vagi. Because of the nature of the blood supply, the mobilization of the abdominal œsophagus is begun at the left and stopped at the division of the diaphragmatic foramen. The displacement of this portion of the œsophagus is materially facilitated by division of the phrenicogastric ligament. After circular incision, the peritoneum is carefully dissected off bluntly, this procedure permitting better hæmostasis and preservation of the serosa and the costal pleura. Both vagi are divided in the region of the cardia. Before operation on the abdominal portion of the œsophagus, somatometric studies will give valuable information as to the position of the organ and the best plan of operative intervention.

HERMANN REINBERG (Z).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Duncan, J. H.: Primary Peritonitis: Pneumococcic and Streptococcic. *Canadian M. Ass. J.*, 1931, xxiv, 778.

This report is based on sixty-seven cases of primary peritonitis which were treated in the period from 1919 to 1929. All but one were treated in the Hospital for Sick Children, Toronto. In thirty-four the condition was due to the pneumococcus and in thirty-three to the streptococcus. Fifty per cent of the patients were between three and eight years of age and 80 per cent were females. The percentage of females was higher in the cases due to the pneumococcus than in those due to the streptococcus.

There are at least three portals of entry for the infection: the genital tract, the blood stream, and the intestinal tract.

The author discusses the differential diagnosis.

The total mortality in the cases reviewed was 68.6 per cent. The mortality in the cases of pneumococcic infection was 59 per cent, and the mortality in the cases of streptococcic infection 80 per cent.

The author believes that in the early stages operation should not be undertaken, but that the patient should be given fluid, saline solution, glucose, blood transfusions, and adequate amounts of antipneumococcus or antistreptococcus serum until the condition has become localized. JACOB M. MORA, M.D.

GASTRO-INTESTINAL TRACT

Lehmann, W.: The Etiology of the So-Called Spastic Diseases of the Gastro-Intestinal Tract—Pylorospasm, Cardiospasm, Hirschsprung's Disease (Die Ätiologie der sogenannten spastischen Erkrankungen des Magen-Darmkanals—Pylorospasmus, Kardiospasmus, Hirschsprungsche Krankheit). *Beitr. z. klin. Chir.*, 1931, cli, 395, 501.

The so-called congenital pyloric stenosis of infants (pylorospasm) is congenital only insofar as the function of the pyloric ring is disturbed from the time of birth. The functional occlusion of the pyloric ring is compensated by an increasing hypertrophy of the wall in which the entire stomach, but particularly the musculature of the antrum, participates. The musculature of the pyloric ring itself, in contrast to that of the antrum and rest of the stomach, shows no hypertrophy or increase of elastic fibers. Clinical manifestations first appear when, as the result of the persisting muscular contractions and the summation of stimuli thereby produced, an increased vagotonus is manifested by vomiting, hyperperistalsis, gastric spasm, and obstipation. The familial occurrence and the greater frequency of pylorospasm in males are in accord with the assumption of a congenital sphincter

disturbance. In the Rammstedt operation the pyloric ring requires greater consideration than was formerly accorded it because the musculature, not only of the antrum, but also of the pyloric ring itself, is divided.

Esophageal dilatation and hypertrophy may result from a congenital disturbance of function of the cardia. A large number of the cases of cardiospasm occurring in later life have their origin in childhood, if not in infancy. Symptoms need not appear as long as compensation takes place by muscular hypertrophy. The condition becomes manifest only when the dilatation is severe. Psychic affections play a dominant rôle. The excellent results of gastro-œsophago-anastomosis and the retrogression of the œsophageal dilatation following this procedure and the Heller operation clearly show that the origin of so-called cardiospasm is a functional disturbance of the cardiac sphincter.

Hirschsprung's disease is best defined as marked constipation dating from birth which is associated with a progressive increase in the size of the abdomen and hypertrophy and dilatation of the colon in the absence of a pathologico-anatomically demonstrable organic obstruction. The assumption that it is congenital is incorrect. The hypertrophy, like that of pyloric stenosis, occurs after birth above a sphincter in which function is disturbed. The sphincter responsible is frequently the internal anal sphincter. However, it is also often the pelvic rectal sphincter, the functional and clinical importance of which is not to be doubted. In very rare cases a tonic sphincter action occurs in other portions of the colon. Under certain circumstances, an abnormally enlarged sigmoid loop or multiple loop formation may lead to a syndrome similar to that of Hirschsprung's disease without having anything etiologically in common with the latter. Volvulus is also to be differentiated, even though the clinical and anatomical pictures of the end stages may show a great similarity to those of Hirschsprung's disease.

In pyloric stenosis as well as in cardiospasm and the so-called congenital megacolon, sphincter disturbances play the chief etiological rôle. They cause retention, hypertrophy, and dilatation of the viscus behind the sphincter. The hypertrophy represents a compensatory process which precedes the dilatation. Since our knowledge of the nature of pathological sphincter action is limited, our surgical therapy can be only symptomatic and not causal. Depending on the localization of the sphincter closure, we can only reduce the resistance of the closed door, force it, short-circuit it by means of a new opening, or make the passage patent by creating a breach. It must be left to the future to correct the defective mechanism by other (physiological) means.

In the discussion of this report, WENDEL reviewed his experience in numerous cases of cardiospasm. He emphasized Sauerbruch's theory that in many cases the cardiospasm is only the symptom of a neurosis, and presented an illustrative case history. He is convinced that the Heller method is inadequate for severe cases, and that in milder cases it can probably be replaced by the safe dilatation of Gottstein or Starck with the instruments devised therefor. Of the radical methods, cardioplasty competes with Heyrowski's œsophagogastro-anastomosis. Cardioplasty was done in three cases with complete success.

STARCK attributed cardiospasm chiefly to a disturbance of the tonus of the cardia.

FROMME stated that he had done the œsophagogastro-anastomosis according to Heyrowski seven times in thirteen operations on the cardia. The patients so treated were cured. SONNTAG (Z).

Chianello, C.: The Effect of Roentgen Irradiation at the Level of the Sixth, Seventh, and Eighth Dorsal Vertebrae on Gastric Sensibility and Secretion (Influenza delle irradiazioni X all'altezza dei corpi vertebrali 6-7-8 dorsali sulla sensibilità e sulla secrezione gastrica). *Clin. chir.*, 1931, vii, 371.

The author discusses the experimental work in which, on the basis of the theory that gastric ulcer is caused by vagus-sympathetic imbalance, attempts have been made to influence gastric secretion by section of the nerve supply of the stomach. He then reports his own investigations with roentgen irradiation at the level of the sixth, seventh, and eighth dorsal vertebrae.

He gave irradiations of ten minutes' duration with a filter of a 2 mm. of aluminum and 1 mm. of zinc, a spark gap of 30 cm., and a focus-skin distance of 30 cm. In the majority of patients there was a marked increase of free hydrochloric acid, but the pepsin index remained unchanged. No corresponding increase was found in the total acidity. In two cases there was no increase in the total acidity although the free hydrochloric acid was increased. In all of the patients the epigastric pain and subjective feeling of acidity ceased after the first or second irradiation. While other investigators have found a decrease in acidity and pepsin after direct irradiation of the stomach, the author's results showed an increase in acidity and no change in the pepsin values. As under both conditions the pain was completely relieved, it appears that pain and acidity are not related etiologically and that the effect on sensation in both groups of cases was caused by direct action on the sympathetic nervous system.

AUDREY GOSS MORGAN, M.D.

Dragstedt, L. R., Montgomery, M. L., Ellis, J. C., and Matthews, W. B.: The Pathogenesis of Acute Dilatation of the Stomach. *Surg., Gynec. & Obst.*, 1931, liii, 1075.

The authors call attention to a new theory regarding the origin and pathogenesis of acute postopera-

tive dilatation of the stomach which is based on the findings of recent studies of the physiology of gastric and pancreatic secretion. This condition is of frequent occurrence, but often is not recognized until too late, if at all. Its outstanding features are an enormous sudden enlargement of the stomach, regurgitation of large amounts of fluid, progressive dehydration with suppression of urinary secretion, and occasionally symptoms of tetany. Death results if adequate treatment is not instituted early. The authors believe that every abdominal operation with extensive stimulation of visceral afferent nerves is followed by gastric relaxation of some degree.

The striking postmortem finding is a huge dilatation of the stomach often filling the entire abdominal cavity and sometimes extending into the pelvis. The stomach contents consist of gas and a thin greenish-black fluid in large quantities. The walls of the stomach are thinned out and the mucous membrane is pale, but there is no interference with the blood supply of the gastric wall. The duodenum is often distended or dilated, and where it passes over the spine it is compressed.

The mechanism of the condition is probably a nervous reflex. Carlson and Luckhardt have shown experimentally that it is possible to obtain visceral reflexes from the stimulation of either visceral or somatic sensory nerves. Relaxation of the stomach to a lesser degree has been observed after section of the vagi. While in most cases, acute dilatation of the stomach follows an operation on the gall bladder or the female genital organs, it may occur also after injuries to the face and extremities. The degree of gastric relaxation seen in man cannot be produced in animals by any amount of sensory stimulation.

Rokitansky was one of the first to suggest that gastric dilatation may be due to obstruction produced by pressure of the superior mesenteric vessels on the transverse portion of the duodenum. Dragstedt's experiments suggest that toxic substances with a pronounced secretagogue action are absorbed from the duodenum. The duodenal obstruction secondary to gastric dilatation results in increased intraduodenal tension. The toxic substances mentioned have been found to cause a marked stimulation of gastric, pancreatic, and duodenal secretion. When these intestinal juices and bile are prevented from passing into the intestines, they accumulate in the dilated stomach. The evidence suggests the occurrence of a primary gastric dilatation reflex in origin, either during the course of an extensive operation or immediately after it. Mechanical occlusion of the duodenum is then caused by direct pressure of the distended stomach on the duodenum in its passage over the spine or by secondary mesenteric compression brought about by downward compression of the small intestines into the pelvis. The dilatation of the atonic stomach is produced by swallowed air together with the accumulating secretions of the stomach and duodenum. The fluid is composed of gastric and pancreatic juice, bile, and the secretions of the upper duodenal mucosa. The cause of death

is failure of resorption of gastric and pancreatic juices, and especially of the inorganic elements, sodium and chlorine, excreted in these fluids. The failure of absorption in turn depends on the inability of the atonic stomach and duodenum to propel these secretions into the lower bowel where their absorption can take place. In some cases a secondary mesenteric obstruction of the duodenum occurs, producing a further obstacle to the passage of the secretions into the lower bowel.

JOHN W. NUZUM, M.D.

Camp, J. D.: The Roentgenological Significance of Pyloric and Prepyloric Deformities. *Radiology*, 1931, xvi, 847.

The interpretation of deformities of the pyloric end of the stomach below the incisura angularis as observed in roentgenograms and on the fluoroscopic screen has long been a perplexing problem to the roentgenologist. Although this segment of the stomach is most accessible to roentgenological observation, it offers more diagnostic difficulties than any other.

Fluoroscopic observation is indispensable to a thorough examination of the pyloric area and is best accomplished with the use of only a small amount of barium.

A list of pathological conditions affecting the pars pylorica would include most of the lesions to which the stomach is subject. However, in the interpretation of roentgenological defects the chief conditions to be differentiated are malignancy, benign ulcer, pylorospasm, syphilis, and hypertrophic pyloric stenosis. In the consideration of ulcerating lesions in the pyloric region the examiner must bear in mind the fact that in this region carcinoma is much more frequent than benign ulcer. Because of its accessibility to examination, pyloric carcinoma should be diagnosed earlier than carcinoma in the pars media or cardia. This is undoubtedly the case, yet the disease is not being diagnosed early enough, as is indicated by the fact that of 2,078 cases of carcinoma of the stomach seen at the Mayo Clinic in the period from 1920 to 1924, the condition was obviously inoperable in approximately 50 per cent, an inoperable lesion was found at exploration in 25 per cent, and resection could be accomplished in only 25 per cent.

On the basis of their roentgenological characteristics, pyloric carcinomata may be grouped as follows: (1) polypoid carcinomata with or without ulceration; (2) scirrhous carcinomata; (3) malignant degeneration of benign ulcers; and (4) malignant degeneration of benign tumors.

Prepyloric ulcer exhibits the same general roentgenological characteristics as gastric ulcer elsewhere. The associated spasm is marked and out of proportion to the size of the crater. Because of the severity and the proximity of the lesion to the outlet of the stomach, the patient usually seeks relief before the crater has reached the size of ulcers seen elsewhere. The majority of the so-called

pyloric ulcers are found by the surgeon and pathologist to be duodenal ulcers at the base of the cap, adjacent to, and occasionally involving, the pyloric ring. As a rule the exact situation is rendered uncertain by the associated pylorospasm which narrows the outlet and elongates the usual pyloric constriction.

Spastic phenomena at the pylorus are so consistently produced by ulcers elsewhere in the stomach that other gastric lesions should be carefully sought in all cases even when a prepyloric niche is demonstrable. Occasionally a perforating duodenal ulcer will produce so much deformity in the base of the duodenum, pylorus, and prepyloric segment as to render the primary site of the lesion doubtful.

Gastric syphilis commonly involves the pyloric area. The predominating change is a diffuse gummatous infiltration of the gastric wall which produces roentgenological changes simulating those of scirrhous carcinoma, prepyloric ulcer, and hypertrophic pyloric stenosis. The prepyloric segment is narrowed in a concentric and symmetrical manner, and the mucosal markings are obliterated. The striking difference from scirrhous carcinoma is the absence of a palpable mass.

Pyloric narrowing produced by hypertrophy of the pyloric musculature will simulate early prepyloric disease. This abnormality is characterized by symmetrical annular narrowing with elongation of the pyloric canal and is not affected by antispasmodics. The pylorus is never gaping. Partial obstruction is the rule. The gastric mucosa is unchanged.

Extragastric conditions that secondarily deform the pyloric area are: (1) reflex spasm, (2) extrinsic pressure, (3) adhesions, and (4) malignant disease with secondary infiltration of the stomach.

Besides the deformities discussed, there are other conditions that may involve the pyloric area. Their incidence is such, however, that they are seldom of much concern to the average roentgenologist and therefore have not been considered in this article.

Because of the multiplicity of conditions affecting the pylorus and pyloric area, it is not surprising that a conclusive diagnosis is often extremely difficult. In some cases only a descriptive or indeterminate diagnosis is possible on the basis of the roentgen findings and the decision as to the nature of the condition must be left to the clinician, surgeon, and pathologist.

Singer, H. A.: Primary, Isolated Lymphogranulomatosis of the Stomach. *Arch. Surg.*, 1931, xxi, 1001.

Pathologists have known for many years that lymphogranulomatosis may have its origin, not only in lymph glands, but also in any organ or structure that normally contains adenoid tissue. Primary growths in the spleen, the liver, the bone marrow, and the lungs are difficult to diagnose early or to treat surgically, whereas, those occurring in the gastro-intestinal tract, particularly in the

stomach, usually cause prompt manifestations and can be removed with relative safety.

Six cases of primary, isolated Hodgkin's disease of the stomach have been recorded in the literature. The pre-operative diagnosis was either carcinoma or ulcer. Gastric resection was performed in all. Five patients recovered and remained well as long as they were under observation. One patient died a month after the operation from obstruction of the stomach. In the case of this patient no gross evidence of other lymphogranulomatous lesions was found at autopsy, but no mention of microscopic examination of the various organs is made in the records. A seventh case of isolated Hodgkin's disease of the stomach, the first to be reported in America, is unique in that a complete history and a careful gross and microscopic examination at autopsy failed to disclose a previous or associated lesion elsewhere in the body.

The clinical diagnosis of isolated lymphogranulomatosis of the stomach is hardly possible in the present state of our knowledge. The systemic and hematological manifestations are generally absent when the lesion is in the operable stage. The discovery at operation of a soft, flat infiltrating tumor strictly limited to the distal portion of the stomach and associated with a disproportionate number of large, succulent, isolated adenoid-like glands should suggest the condition. The final diagnosis requires microscopic examination.

Even when careful exploration fails to demonstrate evidence of granulomatous tissue other than that extirpated, the prognosis should be guarded. Gross lesions in inaccessible regions and microscopic involvement in the structures examined at operation may escape detection. When the involvement precludes resection, the patient should be given the benefit of X-ray therapy. JOHN J. MALONEY, M.D.

Sole, R., Piñeiro Sorando, J., and Mosto, D.: Gastro-duodenal Ulcer. Anatomicoclinical Interpretation (La ulcera gastroduodenal. Interpretación anatómico-clínica). *Congreso Argent de Ciruj.*, Buenos Aires, 1930, p. 62.

The authors review the clinical and histological findings in forty cases of peptic ulcer. The histological findings were such as to preclude the possibility of cure under medical treatment. In many of the resected stomachs the structure of the gastric mucosa was so changed that even histological examination hardly permitted its recognition. The almost complete atrophy, the absolute regressive intestinal metaplasia with loss of glandular structure, and the fibrosis of the submucosa are lesions which do not undergo differentiated anatomical repair.

Ulcers may be divided into two types—those with little reaction and those with a marked reaction. In the authors' opinion, the latter are the more frequent, infection is a most important factor in gastroduodenal ulcer, and the associated gastritis may explain the intermittency and recurrence of gastric symptoms from ulcer.

In reviewing the surgical treatment of gastroduodenal ulcer, the authors state that any ulcer which has not been definitely benefited by medical treatment should be treated surgically. For ulcer of the lesser curvature they consider gastrectomy the best procedure. In the majority of cases of this condition they operate under local anesthesia supplemented by splanchnic infiltration. They advocate wide resection of the stomach. They believe that gastrectomy is preferable to gastro-enterostomy as it removes the gastritic zone and decreases the hyperchlorhydria, whereas gastro-enterostomy merely diminishes the hyperchlorhydria slightly. Moreover, patients subjected to gastrectomy do not have to restrict their diet as much after the operation as those treated by gastro-enterostomy. All of the authors' patients who were re-examined eight months after gastrectomy were found to be in excellent condition and able to eat an unrestricted diet.

FRANCIS M. CONWAY, M.D.

Trías, A.: The Surgery of the Sympathetic Nervous System in Gastric Disease (La cirugía del sistema neurovegetativo en la patología gástrica). *Riv. de ciruj. de Barcelona*, 1931, i, 71.

In reviewing the anatomy and physiology of the sympathetic nervous system, Trías cites Mackenzie's theory and several other theories regarding referred pain. His article has two parts, the first dealing with neurological surgery in relation to gastric sensation, and the second with neurological surgery in relation to the secretory and motor function of the stomach. As our knowledge of the anatomy and physiology of the sympathetic nervous system is still very incomplete, he warns against excessive enthusiasm regarding neurological surgery in gastric disease at the present time. However, he believes that a great many gastric syndromes, including gastric ulcer, may be explained by disturbances of the sympathetic nervous system, and that neurological surgery will become increasingly more important in the treatment of such disturbances.

FRANCIS M. CONWAY, M.D.

Dubourg, G.: Experimental Studies of the Technique of Gastro-Intestinal Resections (Recherches expérimentales sur la technique des résections gastro-intestinales). *Bordeaux chir.*, 1931, No. 2, 119.

Dubourg reports experiments carried out on dogs in which careful microscopic studies were made of the tissues after the use of different operative techniques and different kinds of sutures. The operations studied were resection of the small intestine with end-to-end anastomosis and gastropylorctomy by the Billroth II method.

The author concludes from his work that crushing forceps should never be used as they do not prevent contamination of the peritoneum except perhaps in cases of prolonged stasis; they favor infection of the sutures and therefore postoperative complications, particularly of the lungs; and they retard healing. Connel's interrupted suture also causes trauma of the

tissues and therefore favors infection. Partial extramucous suture avoids perforation of the mucous membrane which is one of the causes of infection and favors rapid healing because it assures accurate juxtaposition of tissues of the same structure. Absorbable sutures should be used except for continuous suture of the serous coats, in which linen or silk may be employed if desired.

In gastropylorotomy, hæmostasis should be obtained in the usual way. The section of the walls should be made between two elastic clamps. The clamps should be placed at some distance from each other and the section made close against the clamp on the resected stomach end. Frequently the other clamp may be removed and the other end of the stomach or intestine held up with Chaput forceps while the sutures are being applied. A continuous extramucous suture with catgut should be made with careful hæmostasis. When this suture is used the mucous membrane does not herniate between the suture points as it does when it is included in the suture. The serous layers should be sutured with linen.

The burying of the stump is greatly facilitated by denuding the end of the intestine of mesentery and allowing it to project beyond the end of the mesentery. Care must be taken to obtain complete hæmostasis in the denuded part of the intestine. Leaving the mesentery as long as the intestine for fear of injuring its blood vessels interferes with the burying of the stump.

In the complementary gastro-enterostomy, suturing should be done in two layers. In the posterior lip the extramucous continuous suture should be applied before the mucous membrane is sectioned after section of the muscle layer. In the anterior lip the technique is very easy and simple. These steps of the operation are illustrated.

This technique can be applied also to other methods than the Billroth II procedure—the Polyá operation, for example. Since 1930, the author has performed several gastropylorotomies without the use of crushing forceps and with extramucous continuous suture. He reports six cases with perfect operative results. AUDREY GOSS MORGAN, M.D.

Willis, R. A.: *Metastatic Tumors in the Intestines. Australasia & New Zealand J. Surg.*, 1931, 1, 41.

Willis reports 4 cases of blood-borne metastases to the intestine. In 3, the primary lesion was a carcinoma of the breast, and in 1, a carcinoma of the lung.

Despite a rich blood supply, the alimentary tract is rarely the site of blood-borne metastatic growths. In carcinosis of the peritoneum, on the other hand, involvement of the serosa of the bowel is common. The tumor with the greatest tendency to form metastases in the bowel is the malignant melanoma. The 4 cases of blood-borne metastases reported by the author were found in a series of 250 consecutive autopsies performed in cases of malignant neoplasms of all kinds. The incidence of such metastases was therefore only 1.6 per cent.

Case 1. The patient was a woman seventy-four years of age. Clinical examination showed that a primary cancer in the left breast had formed metastases in the axillary glands on both sides and multiple cutaneous nodules in the right loin and buttocks. Death resulted from basal pleurisy on the right side. Autopsy revealed many metastatic pedunculated tumors on the mucosal aspect of the small bowel. On microscopic examination, the primary tumor was found to be an anaplastic carcinoma simplex.

Case 2. The patient was a woman fifty-eight years old who had a primary cancer of the left breast which had been neglected for four years. Death occurred after the appearance of symptoms of intracranial metastases. Autopsy revealed a large infiltrating breast cancer, many milary metastases in the lungs, involvement of the heart, adrenals, and pancreas, and 8 pedunculated and sessile tumor deposits in the small bowel. Microscopic examination showed the primary tumor to be an alveolar carcinoma simplex.

Case 3. The patient was a woman fifty-eight years old who had a primary anaplastic carcinoma of the breast with metastases to the lungs, myocardium, liver, kidneys, pancreas, intestines, dura mater, brain, skull, and thyroid. The first coil of jejunum contained 3 malignant ulcers, the largest of which was 3 cm. in diameter, and the next 2 ft. of small intestine presented small ulcerated and pedunculated growths. Three feet from the pylorus there was an intussusception 10 cm. long and at the apex of the intussusception there was a pedunculated tumor 4 cm. in diameter. Further down on the small bowel a secondary intussusception was found.

Case 4. The patient was a man forty-four years of age who had had a persistent discharge from the ear ever since a radical mastoid operation performed in 1914. Operation for cerebral abscess performed in 1930 revealed a polypus filling the mastoid antrum. Autopsy disclosed tumor nodules in the duodenum and jejunum and a large growth at the hilus of the right lung which had invaded the heart, superior vena cava, and right pulmonary vein. Microscopic examination showed the primary tumor to be a carcinoma simplex.

A noteworthy pathological feature of all four cases was the absence of metastases to the liver. From the clinical standpoint these cases are important because there is danger of acute intestinal obstruction although the primary lesion remains apparently quiescent. Operative interference may suddenly become necessary to save the patient's life.

JOHN W. NUZUM, M.D.

Finsterer, H., and Cunha, F.: *The Surgical Treatment of Duodenal Ulcer. Surg., Gynec. & Obst.*, 1931, lii, 1099.

Many surgeons have found that gastro-enterostomy for duodenal ulcer has given unsatisfactory end-results. Von Haber reported that only 37 per cent of his patients treated by this operation remained symptom free, and Schloffer considered the

results satisfactory in only 50 per cent of his cases. For ten years in Finsterer's clinic, gastro-enterostomy has been performed for gastric or duodenal ulcer only in the rare cases of uncomplicated ulcer in elderly patients. The last 619 operations for ulcer included 516 resections for duodenal ulcer, 90 resections for gastric ulcer, and 13 gastro-enterostomies for duodenal ulcer.

When a duodenal ulcer penetrates into the pancreas, resection of the ulcer base together with a portion of the pancreas is a dangerous procedure. It is better to separate the duodenum from the pancreas carefully, leaving the ulcer base adherent to the pancreas. The opening in the duodenum can then be easily closed, the ulcer base cleansed, and drainage established to prevent peritonitis. In cases in which the ulcer penetrates very deeply and involves such structures as the ampulla of Vater or the common duct, resection is so technically difficult as to be impractical. Therefore the ulcer should be left *in situ* and resection for exclusion should be performed. Finsterer described this resection in 1918 and has practiced it for fourteen years. It is best performed under local analgesia induced by block anaesthesia of the abdominal wall and injection of the splanchnic plexus at the level of the body of the eleventh or twelfth dorsal vertebra. If the duodenal ulcer is adherent to the pancreas its resection may or may not be possible. The duodenum is sectioned and the distal end ligated and inverted by means of a purse-string suture. The stomach is sectioned obliquely from near the cardia on the lesser curvature to near the gastrosplenic ligament on the greater curvature. The line of the resection lies in the line of the direct continuation of the oesophagus. The stomach is closed to within 10 cm. of the greater curvature. The remaining opening is used for the stoma between the stomach and the jejunal loop which is anastomosed end-to-side. By this type of anastomosis, retrograde filling of the duodenal loop is prevented and healing of the ulcer is facilitated. After the Polyá-Reichel method of resection, retrograde filling is not prevented. In the von Haberer modification of the Billroth I type of operation too much tension on the sutures is necessary. Finsterer prefers to modify the Billroth I operation further by making an end-to-side anastomosis between the stomach and duodenum, but forms a stoma in only the lower half of the anastomosis.

The after-treatment is extremely important. At the end of forty-eight hours, liquids are given by mouth very cautiously. Hematemesis is treated with ice water or by lavage with a 1:1,000 solution of silver nitrate. Atony of the stomach and intestine, which is rare after local analgesia, is relieved by the application of heat to the abdomen, warm water enemata, and pituitrin. It is important to get elderly patients out of bed on the second or third day.

In 566 cases of resection there were 18 deaths. The modification of the Billroth II operation had a lower mortality than the modification of the Billroth I operation.

Of 307 patients who were treated by resection for exclusion from three to fourteen years ago, 293 are healed, 4 have been benefited, but are not healed, and 10 are unhealed. In 71 cases in which a Billroth I resection was done there were 6 failures. Of the patients treated by resection for exclusion in which the pylorus was left *in situ*, 90 per cent became symptom free, whereas of those who were treated by resection including the pylorus, only 66 per cent became symptom free.

Finsterer and Cunha are of the opinion that in duodenal ulcer the primary site of the affection is not in the duodenum but in the stomach. Therefore they believe that permanent cure requires radical gastric resection with removal of at least two-thirds of the stomach. Such a resection may be followed by palpitation of the heart, dyspnoea, and nausea for a few weeks, but these symptoms disappear when the recumbent position is assumed. After two or three months the patient will be able to eat a normal meal without discomfort. Pernicious anaemia has followed an extensive gastric resection in only 1 of the authors' cases and in this instance its relation to the operation was doubtful.

EARL GARSIDE, M.D.

Scott, H. G., and Ivy, A. C.: Jejunal Alimentation. *Ann. Surg.*, 1931, xciii, 1197.

After many failures, Scott and Ivy discovered a method and a pabulum for jejunal alimentation in dogs which will maintain the body weight for long periods. The pabulum consists of flour, water, cane sugar, milk, cream, and peptone. Each 100 c.c. of this mixture contains 3.5 gm. of protein, 8.10 gm. of carbohydrate, and 4.30 gm. of fat. The pH of the mixture is about 6.0. Sufficient sodium chloride to maintain the chloride balance and the requisite quantity of vitamins are included.

This pabulum is non-irritating to the gut and easily assimilated. It is best tolerated when it is administered at the rate of gastric evacuation, which prevents distress from overdistention of the jejunum and peristaltic rushes from its sudden emptying into the colon.

The authors are convinced that this pabulum and their method of administering it will prove of value in clinical cases.

JACOB M. MORA, M.D.

Schoemaker: Acute Dilatation of the Colon (Akute Colondilatation). 55 Tag. d. deutsch. Ges. f. Chir., Berlin, 1931.

Acute dilatation occurs not only in the stomach, but also in the colon. Acute gastric dilatation is the result of an operation, but acute dilatation of the colon occurs without apparent cause. The author has seen seven cases of the latter condition. The patients ranged in age from forty-two to seventy-nine years. The clinical signs were those of an obstructive ileus. In all of the cases a deep carcinoma was suspected. There is no way in which a differential diagnosis can be made. If no flatus or stool is evacuated after enemata, the abdomen must be opened. In none of the cases reviewed was a

carcinoma found. In two cases the colon was greatly distended from the cæcum to the anal ring. In others, the distention involved only isolated portions, particularly the transverse colon. If no obstruction is discovered, a Witzel fistula should be made. After three or four days the bowel will be emptied by the normal route. The absence of blood in the stools is an indication that no pathological condition of the mucosa or intussusception-like process is present. Later the fistula may be closed. Of the patients whose cases are reviewed by the author, six survived operation and are well again. The patient who died was a man seventy-nine years old who was treated before the author was well acquainted with the picture of the disease. At the operation performed on this patient for closure of the fistula Schoemaker searched too long for a carcinoma.

In the discussion of this report, ANSCHUTZ stated that he had seen only one such case and saw that case on the autopsy table. The colon was so distended that it was almost bursting. No cause could be discovered. As a rule an obstruction will be found in the transverse colon or rectum. Valve formations at the anatomical narrowings play the most important rôle. The obstruction may possibly be brought about also by functional or nervous disturbances. Retroperitoneal hemorrhages can work mechanically as well as through the medium of the nervous system.

FISCHER emphasized that in addition to the so-called neuroses or nervous dysfunctions of the intestinal motor and secretory apparatus, disturbances of absorption are to be considered. Of the gases formed in the intestine, nine-tenths are absorbed and only one-tenth is eliminated as flatus. Even a very slight disturbance of this physiological absorption of gas must lead to meteorism, and under such conditions a valvular mechanism is easily created at various points in the pelvic colon. The distended colon presses the anterior wall of the rectal ampulla against the posterior wall and the greater the accumulation of gas the more complete is the obstruction. We do not know the finer nervous mechanism, but the mechanical conditions are probably the same as those present in ureteral colic.

CLAIRMONT stated that in his opinion dilatation of the colon is usually due to a mechanical obstruction caused, as a rule, by the sphincter. The picture is that of a sclerotic anal sphincter. In every case, therefore, the attempt should be made first to relieve the condition by stretching the sphincter. The closure of the sphincter can be so strong that neither stools nor gas can pass through. STETTINER (Z).

Aigrot: Three Cases of Rare Intestinal Occlusion

—Volvulus of the Cæcum and Strangulated Hernia of the Foramen of Winslow (Trois cas d'occlusion intestinales rares—volvulus du cæcum et hernia étranglée de l'hiatus de Winslow). *Bull. et mém. Soc. nat. de chir.*, 1931, lvi, 554.

The first case reported was that of a man aged forty-three years who experienced a sudden pain in

the right iliac fossa which was soon followed by vomiting. No gas was passed. After twenty-four hours, perforation of the appendix was suggested by parietal muscular defense, a temperature of 38.5 degrees C., and a pulse of 140. Operation was performed twenty-four hours after the onset of the pain. A median incision gave issue to a dirty reddish fluid and disclosed a black mass with greenish plaques of intestinal gangrene. This mass was formed of the cæcum and the ascending colon held in place by a long and twisted mesentery. It was exteriorized and resected and a laterolateral anastomosis was made between the terminal ileum and the transverse colon. Forty-eight hours after the operation gas was passed by anus. Drainage was discontinued after eight days, and four weeks after the operation the only disturbance was frequency of defecation which showed gradual improvement.

The second case was that of a patient aged twenty-three years who gave a history of violent abdominal pains for three days, during which time no feces or gas was passed and abnormal peristalsis was noted. The temperature was 38.1 degrees C., the pulse was 140, and palpation of the abdomen revealed a voluminous mass on the right side which suggested an obstruction in the cæcum and ascending colon. At operation, the mass was found to consist of the cæcum and ascending colon. It resembled a bottle with its neck turned toward the right and presented a screw groove indicating torsion of an intestinal loop on its axis. The loop was unwound and the cæcum fixed to the wall of the iliac fossa. After closure of the median incision a cæcostomy was performed. Forty-eight hours after the operation a stool was passed and thereafter intestinal function became normal. On the twelfth day the cæcal fistula was closed.

ALGLAVE, who read Aigrot's report to the Society, said that true volvulus of the cæcum is very rare. Torsion around the mesenteric axis (Aigrot's first case) should be called "ileocolic volvulus," and torsion around the axis of the colon (Aigrot's second case) should be called "cæcocolic volvulus."

Volvulus of the cæcum is most frequent in the Baltic provinces, apparently because of anatomical and alimentary conditions. Lenormant estimates the number of cases in France at between twenty and twenty-five. The volvulus seems to be favored by mechanical conditions and to be provoked by physiological conditions. Essential extrinsic mechanical factors are great mobility of the terminal ileum and of the first portion of the colon and the presence of nearly fixed points or points of support about which the organs may turn. The intrinsic mechanical conditions are related to the internal configuration of the ileocæcal segment, particularly the ileocæcal valve. Sufficiency of the ileocæcal valve combined with constriction of the ascending colon favors volvulus of the cæcum.

Physiological conditions provoke volvulus through the effect of exaggerated intestinal peristalsis in the normal direction or in the opposite direction and

probably with sudden distention of the cæcum by fluid or gas.

Volvulus with premonitory signs is less frequent than volvulus occurring suddenly. In the former there is doubtless first a state of caecal stasis due to anatomical factors such as those described, with which some torsion of the cæcum is produced from time to time. Under such conditions, over-eating, a more marked constipation than usual, or a pregnancy may precipitate volvulus.

Volvulus beginning suddenly is seven times more frequent than volvulus occurring gradually. It may be due to a sudden effort such as that of returning a ball in tennis, a fall, the efforts of labor or defæcation, or the application of sudden cold to the abdomen. A case illustrative of the effect of sudden cold is reported. The chief causes are the direct effects on the intestine of drastic purgatives, vermifuges, or irritating drugs.

In Aigrot's third case a strangulated hernia occurred near a duodenal ulcer at the entrance of the foramen of Winslow. PAGE.

FitzGibbon, G., and Rankin, F. W.: Polyps of the Large Intestine. *Surg., Gynec. & Obst.*, 1931, lii, 1136.

In this article, FitzGibbon and Rankin review the histopathology of polyps, show that these neoplasms are not all alike, call attention to the fact that the name "polyp" is applied to definitely precancerous formations, and trace from formations of the latter type the growth of numerous typical and deep carcinomata of the large intestine.

In the reports of cases, only autonomous new growths, true blastomata of the intestinal mucous membrane which have not yet become definite carcinomata, are called "polyps."

The polyps may be readily classified into three major histological groups as follows:

Group 1. This group includes only growths in which the epithelium retains its normal characteristics. As a rule the tumors are roughly nodular, but in some of the specimens the surface is smooth and regular. Although the epithelium covering the growth and lining its crypts is unchanged from the standard regarded as normal, nevertheless evidence of slight hyperplasia may be present in scattered areas. Such areas are the sites of more or less active inflammation secondary to the trauma to which the tumors in their exposed positions are constantly subjected. The polyps vary in size from tiny clubs about 3 mm. in diameter to masses 1 or 2 cm. in cross section. Loose connective tissue derived from the submucosa forms the matrix of the stalk and expands to sustain the nodular polyp. The growths show no tendency to assume branching or papillary forms.

Polyps of Group 1 are invariably pedunculated. Even in the smallest tumors of this group encountered in the authors' specimens there is evidence of the formation of a stalk. The pedicles are usually cylindrical structures varying in length up to 6 cm. or more, which are composed of connective tissue

derived from the submucosa and are covered by normal appearing mucous membrane.

There is nothing about the tumors of Group 1 to indicate that they are any more liable to malignant change than normal intestinal mucous membrane. It may therefore be said that these polyps are destined to a long and benign course.

Group 2. The polyps of this group are easily distinguished from those of Group 1 by the abrupt and striking structural changes in both the epithelium and the connective tissue elements. The epithelium is characterized by widespread failure of the proliferating cells to differentiate completely into the units of normal intestinal mucosa. In the polyp epithelium the cells are hypertrophied, elongated, and compressed from side to side by their increased bulk. They may remain arranged in single rows, but in numerous places the press of overgrowth piles them into multilayered buds that project usually into the lumina of tubules and frequently into the connective tissue matrix as well. The nuclei, like the cells, are elongated. They are stained more deeply by all the routinely used dyes and thus give to the proliferation a darker and easily recognized color. In the cellular protoplasm the production of mucus is sharply diminished.

These epithelial changes do not appear equally advanced throughout the group. Particularly in the early forms, they are usually found first in a peripheral dark zone of greater cellular activity. As the polyp ages, the changed epithelium infiltrates, overgrows, and chokes the more differentiated structure and gradually displaces it completely.

The peripheral dark zone so characteristic of growing polyps is composed almost entirely of complexes of glandular tubules. These tubules, increased in both diameter and length by the hypertrophy of the component cells, are crowded and pressed into a tangled mass. Cellular activity is often found at its height at the points where the epithelium of the tubule debouches onto the surface of the tumor and spreads out over it to form an investing membrane. In places, the tubules of the polyps can be seen projecting down between the more normal glands at the base of the tumor. Nearly every polyp of this type shows cystic enclosures which have been formed by the accumulation of secretion in the deformed and obstructed glands.

As this process of epithelial proliferation goes on, there is a complementary response in the connective tissues of the submucosa. The tug of the tumor soon pulls the muscularis mucosæ and some of the fibrils of the underlying looser areolar tissue upward to form a tiny stalk. If growth is not too brisk, the connective tissue elements are drawn out into ever-branching divisions which form a tree-like supporting scaffold for the epithelial complexes. However, at irregular places in polyps of this group the epithelium may grow out in long, tender tendrils that give to these areas a shaggy, papillary structure. It is these tendrils that are readily injured by intestinal action and thus become the sources of the hamor-

rhages so characteristic of the course of tumors of this type.

The polyps of Group 2 are invariably pedunculated. The flattened, hemispherical excrescences set apparently in or on the intestinal mucosa like a plush- or velvet-covered button in overstuffed upholstery are sessile tumors, the overhanging edges of which conceal their stalks.

Group 2 includes most of the polyp formations developing in the large intestine. It is well known, however, that the growths are not consistently benign.

It appears that the development of carcinoma in polyps depends on the rate at which the tumor grows. In the slowly growing formations of Group 1 there is little, if any, likelihood of cancerous change. In the more rapidly growing polyps of Group 2 it is a question only of time until carcinoma appears.

Group 3. In the polyps of this group, as in those of Group 2, there has been failure of the epithelium to differentiate. However, this group includes only tumors in which the processes of differentiation of the epithelium were arrested at such an early stage that the cells have attained only the most rudimentary characteristics of the normal units of intestinal mucosa. Accordingly there is no sharp line of separation between the polyps of Groups 2 and 3 as there is between the polyps of Groups 1 and 2. In the older polyps of Group 3, the cellular changes are advanced and unmistakable; in the younger polyps, other and secondary features of the tumors help to identify them.

Polyps of Group 3, like those of the other groups, must start in an overgrowth of glandular tubules in the mucosa. At first, the tubules undergo prolongation and enlargement. The tiny growths are found to be situated not so much on the tops of the folds as scattered haphazardly over the mucous membrane.

Polyps of this group ordinarily attain only the size of a split pea (6 to 8 mm.). This uniformly restricted growth can be interpreted in only one way. The elementary epithelium proliferates so rapidly that cancerous change is approached before the tumor becomes large enough to be played upon by the forces of peristaltic action and before the more temperate connective tissues have a chance to respond to such demands for growth.

It is this lag in the connective tissue stroma that gives to polyps of Group 3 their characteristic appearance of rank confusion in the epithelial overgrowths. Cellular activity at the points where the tubules open on the surface must result in a disorganized nodule if there is no connective tissue to support an orderly papillary projection. A similar course must be followed in the buds in the tubules themselves. Here the enlarging tubules must grow downward as there is no structure to sustain an upward proliferation. In fact, tubules are to be seen proceeding into the normal mucosa from which they have developed and which they will ultimately infiltrate, compress, and destroy. As in Group 2, the irregular tubules become so convoluted that they are

frequently obstructed and numerous cysts are formed behind them. In the polyps of this group no recognizable attempt is made at organoid formations. Moreover, cells of these epithelial complexes can no longer be distinguished morphologically from those seen in outright carcinoma. Apparently only a relatively short time elapses before polyp proliferations of this type burst the barriers of the muscularis mucosae and become deeply infiltrating, that is, carcinomatous.

The sites of the proliferations of Group 3 have been found scattered throughout the intestinal mucous membrane. Similar areas of this same type of proliferation are to be seen also on the surface of certain polyps of Group 2. In these buds of solid cords of epithelium, the cells, no longer moored to the glandular structure of the tubule, have thrown off their columnar-cell characteristics and have become one-eyed vesicles, the form for the repeatedly described and so-called carcinoma cell.

Haberer, von: Improvement of Our Results in Resections of the Colon and Acute Ileus (Verbesserung unserer Resultate bei Dickdarmresektion und akutem Ileus). *55 Tag. d. deutsch. Ges. f. Chir., Berlin*, 1931.

The mortality of resection of the large bowel is still very high. The one-stage operation has a mortality of over 26 per cent. In acute ileus the one-stage operation is today contra-indicated. Even in borderline cases the formation of a fistula is preferable to resection.

In investigating the causes of death one usually finds that the course is at first quite favorable and that stools are soon evacuated. However, evacuation is not sufficiently complete and intoxication results. Cardiac weakness then ensues, and death results unless a fistula is made quickly. In the fatal cases the pathologist finds nothing which explains death. As is shown by experiments on dogs, the peristaltic waves do not at first pass over the suture line (not even when an end-to-end suture is done). Stasis therefore results. To prevent stasis with its injurious consequences, the author has established a Witzel fistula to act as a safety valve in all one-stage resections of the left half of the colon with end-to-end anastomosis. He allows this fistula, which is made immediately above the anastomosis, to remain for six or seven days. At the end of that time it has almost always closed. The duration of the illness was not prolonged by the addition of the fistula.

The author is now performing the one-stage operation also in cases of acute ileus with moderate general symptoms. Sometimes it is necessitated by the conditions present. Occasionally it is very satisfactory in borderline cases. Among twenty-five cases operated upon according to this principle there were only four deaths and these could not be attributed to the operation. In one case death was due to pneumonia; in another, to embolism occurring on the twenty-first day after the operation; in a third, to a very poor general condition; and in a fourth, to a sub-

fascial prolapse. Frequently stools were passed by the natural route on the third day in spite of the fistula.

In the discussion of this report, SCHMIEDEN emphasized that in resection of the large bowel the dependability of the suture line is of the utmost importance. In the presence of ileus there are two diseases—ileus and carcinoma. Each must be treated separately. In general, Schmieden's experience has agreed with that of von Haberer.

ANSCHUTZ stated that he also performs a two-stage operation only in the most severe cases. He called attention to the fact that statistics of one- and two-stage operations cannot be compared. In the Mikulicz clinic the mortality was once between 10 and 12 per cent, but today cases are operated upon which were previously regarded as inoperable. The addition of a fistula is an old procedure. However, according to Anschuetz's experience, the fistula does not function satisfactorily. In order to bring about a true evacuation, an artificial anus must be established. Appendicostomy fails to give satisfactory results.

KOENIG stated that frequently small scybala are sufficient to cause serious disturbances in the surgically traumatized colon. He recommended, in accordance with Pendl's suggestion, that small doses of castor oil be given on the day of the operation and repeatedly thereafter.

CLAIRMONT said that he did not accept von Haberer's suggestion to do a primary resection in ileus as he had had some unfavorable experiences with it. He does not believe that the operation is improved by the establishment of a fistula. He stated that whenever the large bowel is resected it is necessary to stretch the sphincter and, in addition, to insert a tube from the anus into the intestine above the level of the suture line.

In closing the discussion, VON HABERER emphasized that he did not recommend resection for ileus in general. He believes it should be considered only in cases in which the general condition is satisfactory. He stated that he also stretches the sphincter in every case of resection of the large bowel.

STETTINER (Z).

Watkins, R. M.: *Appendicitis in Children Under Thirteen Years of Age*. *Ohio State M. J.*, 1931, xxvii, 461.

The author reviews 111 cases of appendicitis in children from two to twelve years of age. The cases are grouped according to the pathological changes as acute simple, chronic, and acute suppurative. Thirty-eight were of the acute simple type, 54 of the chronic type, and 19 of the acute suppurative type.

Abdominal pain was present in all, either before or at the time of the patient's admission to the hospital. Seventy-one per cent of the patients vomited. Only 20 per cent were constipated. Rigidity of the abdomen was present in 63 per cent of the cases, and distention of the abdomen in 18

per cent. The white blood-cell count and abdominal tenderness were typical of the disease. Complications developed in 12 per cent of the cases. In cases of the acute suppurative type, the mortality was 5.2 per cent, and in those of all other types combined it was 9 per cent.

Walker emphasizes that normal bowel elimination and absence of distention do not necessarily rule out the presence of appendicitis in children.

ROBERT ZOLLINGER, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Henschen: *Acute Toxic and Infectious Swelling of the Liver—Acute Hepatic Glaucoma—and Its Surgical Treatment* (Die akute toxische und infektiöse Schwellung der Leber—akutes Leberglaukom—und ihre chirurgische Behandlung). 55 *Taf. d. deutsch. Ges. f. Chir.*, Berlin, 1931.

There is a renal condition characterized by pain and swelling which is designated as "renal glaucoma." For a similar condition occurring in the liver Henschen proposes the name "hepatic glaucoma." In the latter there is a disturbance of physiological mechanics. The author calls attention to the peculiar circulatory relations of the liver with its two venous circulations, the hepatic and portal veins. The liver is an organ capable of enormous swelling. It regulates the distribution of the blood. It is worthy of note that there are no capillaries in the liver. Therefore in inflammatory processes there can be no emigration of leucocytes. Nevertheless there is a great flow of blood toward the liver, from the spleen and stomach to the left lobe, and from the small bowel into the right lobe. On account of these anatomical relations, the liver parenchyma is particularly apt to become swollen.

The author distinguishes the following four types of swelling of the liver:

1. An acute inflammatory condition of the liver. This reacts with inflammatory oedema without leucocytic exudation. A typical case was that of a young man who was taken ill with severe pain in the right hypochondrium, a fever of 40 degrees C., diarrhoea, mental confusion, and a premonitory state. Liver abscess was suspected. At laparotomy, only swelling of the liver was found. Two openings were made in the liver. The operation was followed by immediate improvement with marked lymphorrhoea. This was a case of interstitial oedematous hepatitis, an acute oedema, perhaps the precursor of acute yellow atrophy. In hepatic cirrhosis there may be swelling which suggests gall-stone disease.

2. A condition in which the liver participates in general in the excursions of the diaphragm. The X-ray clearly shows the displacement of the liver upward and downward. With stasis in the region of the hepatic vein, the liver may swell to such a degree as to cause marked elevation of the diaphragm leading to cardiac insufficiency and icterus. In this condition also only a swelling of the liver is found.

3. Parenchymatous swellings in which the liver cells are swollen.

4. Swellings associated with a certain amount of cholangitic catarrh and excessive secretion of the biliary tract.

Clinically, these conditions are all to be regarded as acute liver swellings. They may be associated with a mild or a very severe liver insufficiency. They may give rise to a hepatogenic ileus or acute dilatation of the stomach.

In the treatment, depending upon the findings, hepatostomy decapsulation with the diathermy needle, cholecystostomy, choledochotomy, or cholecystenterostomy must be considered to relieve the stasis in the biliary tract. STETTNER (Z).

Nord, F.: Cholecystography in Acute Hepatitis (La cholestographie dans l'hépatite aiguë). *Acta med. Scand.*, 1931, lxxv, 205.

Nord reviews eight cases of acute hepatitis (catarrhal icterus) in which cholecystography was done after the oral administration of tetra-iodophenolphthalein in Vichy water twelve hours before the examination, the development of the jaundice was followed by analyses of the blood serum, the Meulengracht test was carried out several times during the course of the disease, the biliary pigment content was determined by the Hijmans-van den Bergh method, and bromosulphthalein tests were made.

The findings show that in cholecystography in cases of acute hepatitis the gall bladder often does fill when there is no reason to assume the presence of lesions involving the great biliary tracts or the gall bladder. This is true especially when jaundice is found to be increasing. In the liver there is a certain parallelism between the capacity to eliminate biliary pigments and the capacity to eliminate the opaque medium used for the cholecystographic examination. PACE.

Ribas Ribas, E.: Biliary Surgery. Lesions of the Gall Bladder as the Basis of Indications for Operation and Surgical Technique (Las lesiones de la vejiga biliar como base fundamental de las indicaciones y de la técnica quirúrgica). *Rev. de ciruj. de Barcelona*, 1931, i, 9.

This article is a review of thirty years' experience in the treatment of gall-bladder disease. The author discusses the pathological anatomy of various gall-bladder lesions and several complications of gall-bladder disease. He states that induration of the pancreas associated with gall-bladder disease may be explained by the relationship between the lymphatics of the gall bladder and those of the pancreas. Pancreatic conditions of this type may be cured by cholecystectomy. Lesions of the gall bladder may often be responsible for pain in the region of the xiphoid process, costal pain, and pain in the region of the base of the right lung. Subphrenic abscess and liver abscesses are frequent complications of lymphatic origin following disease of the gall bladder.

FRANCIS M. CONWAY, M.D.

Klingenstein, P.: Asymptomatic Common-Duct Stones. *Ann. Surg.*, 1931, xciii, 1146.

The classical symptoms of stones in the common and hepatic ducts vary markedly and may be completely absent.

Of eighty-two cases in which a choledochotomy was done, 6 per cent were asymptomatic. The author reports five cases with colic but no other symptoms or signs and without positive laboratory findings. The patients were women ranging in age from twenty-six to fifty-six years. The mean duration of the gall-stone symptoms was six years. The duration of the gall-bladder disturbances did not seem to have any relation to the choledocholithiasis. In all of the cases the gall bladder also contained stones. The absence of symptoms may have been explained by partial patency of the common duct due to the small size of the calculi or initial dilatation of the duct. Stones form in the bile ducts in only exceptional instances.

As choledocholithiasis has been encountered in from 8 to 18 per cent of choledochostomies performed by various surgeons, and as it is difficult to be certain of the presence of stones before operative interference, exploration of the common duct should be done more frequently. This procedure does not materially increase the mortality of gall-bladder surgery. STANLEY H. MENTZER, M.D.

De Takats, G.: The Effect of Ligating the Tail of the Pancreas in Juvenile Diabetes. *Surg., Gynec. & Obst.*, 1931, liii, 45.

When the tail of the pancreas is isolated or tied off, the acini degenerate and undergo sclerosis while the islands of Langerhans undergo hyperplasia and hypertrophy not only in the tail, but also throughout the organ. The sugar tolerance increases, reaches its maximum in four months, and returns to normal in a year.

De Takats isolated the tail of the pancreas in the treatment of two cases of diabetes in children. One child, a diabetic for six years who had been stabilized for two years, showed a definite increase in tolerance which began four months after the operation and has now persisted for seventeen months. The other child, who had been losing tolerance for two years, showed a slight increase in tolerance four months after the operation, lost it after an attack of varicella, and is now slowly regaining it.

The operation was performed under combined nitrous oxide and local anesthesia. The pancreas was reached by cutting through the greater omentum and gastroduodenal ligament. The posterior peritoneum below the pancreas was incised, and the splenic vessels behind the pancreas were separated from the organ. In the author's first case the organ was divided with a radio knife, but in the second it was simply ligated with a strip of fascia lata. No drainage was used. Food was withheld for from forty-eight to seventy-two hours. Ileus was prevented by the use of a Rehfuess tube. In other respects the treatment was the same as that in any operation on a

diabetic. The patient was allowed to get up on the fifth day and to go home on the fourteenth day.

Although the results so far obtained are not startling, the author believes the method has great possibilities.

MAURICE L. DALE, M.D.

MISCELLANEOUS

Brown, H. P., Jr.: Subphrenic Abscess. *Ann. Surg.*, 1931, xciii, 1075.

The author reviews eighteen cases of subphrenic abscess collected from the records of two hospitals.

Subphrenic abscess is usually secondary to the perforation of an abdominal viscus, but may result also from abscess of the spleen, liver, kidney, pancreas, or spine, traumatism, pyæmia, distant foci of infection, or an infection above the diaphragm such as pneumonia, empyema, lung abscess, and osteomyelitis of the ribs. In seven of the eighteen cases reviewed by the author it followed the perforation of an abdominal viscus. When the stomach, exclusive of the pyloric region, the pancreas, or the spleen is the primary focus, the abscess is usually on the left side. Most of the other foci give rise to an abscess on the right side.

The diagnosis is based chiefly on a history of infection, the presence of localized tenderness or

induration, the clinical evidence of pus in the body, and the findings of X-ray examination and exploratory puncture.

In five of the cases reviewed by the author the abscess followed an appendectomy with drainage; in two, the perforation of a gastric ulcer; in two, a cholecystostomy; in one, a cæcostomy; in one, puerperal fever with secondary abscess of the spleen; and in one, an exploration in which no disease was demonstrated, the abscess apparently being overlooked. In six cases there had been no previous operation. In most of the cases drainage was done from six to ten weeks following the primary operation.

The difficulties in diagnosis are discussed. In seven cases of the cases reviewed the correct diagnosis was made before operation. The possible errors in diagnosis are illustrated by abstracts of case reports.

The surgical approach varies with the suspected origin of the abscess. For abscesses presenting in the upper right aspect of the liver, resection of the tenth or eleventh rib with walling off of the pleural cavity from the drainage tract and direct drainage through the diaphragm is recommended.

The mortality in the cases reviewed was 4.4 per cent.

W. N. ROWLEY, M.D.

GYNECOLOGY

UTERUS

Bonney, V.: The Technique of Wertheim's Operation. *Australian & New Zealand J. Surg.*, 1931, 1, 6.

Up to the end of 1930, Bonney had performed the Wertheim operation 407 times. In the total number of cases, the operative mortality was 14 per cent, but in the last 100 cases it was 6 per cent. In the 370 cases in which he performed the operation prior to 1926, the results were as follows:

	Patients
Died of operation.....	51
Lost sight of before five years.....	11
Died of some other disease before five years.....	8
Died of recurrence before five years.....	116
Well after five years.....	124

In the author's opinion, the difficulty of the operation has been greatly exaggerated.

Bonney uses spinal anaesthesia with ether anaesthesia. The ether counteracts the effect that spinal anaesthesia sometimes produces on feeble patients with a low blood pressure. The other anaesthesia should be full and the spinal anaesthesia merely sufficient to block shock impulses. The fatalities reported from the use of combined anaesthesia have all been due to the use of light general anaesthesia combined with spinal anaesthesia.

After the spinal injection the catheter is passed and the vagina packed very tightly with gauze soaked in violet-green solution. The gauze forms a solid column and later can be easily separated from the bladder and rectum. The patient's position and the incision, packing, and retraction are the same as in any other gynecological laparotomy. The ovario-pelvic and round ligaments are ligated as far out on the pelvic side wall as possible. The broad ligaments are clamped and cut on each side and a piece of No. 6 silk is tied about each uterine cornua and left long so that, with its fellow on the opposite side, it may be used as a tractor. The bladder is next reflected from the uterus and vagina and fastened by a suture to the pubic end of the abdominal wound to keep it out of the way. The broad ligaments are then opened up by dividing the peritoneum between the ligatures on the stumps of the round and ovario-pelvic ligaments, respectively, in a line parallel with and outside of the ovarian vessels. Forceps are then placed on these two stumps and pulled upon while, with the finger and a pair of blunt-pointed scissors, the loose areolar tissue is teased away and divided so that the external iliac vein can be plainly seen as it runs along the side wall of the pelvis. The ureter is then sought where it is attached to the posterior peritoneal layer of the broad ligament. The uterine artery is located next, the external iliac vein being

used as a guide, and is ligated. The ureter is then exposed where the uterine artery crosses it and is freed from its bed and followed to the uterovesical junction, the bladder having been separated still further. The same procedure is carried out on the other side.

The rectum is next separated from the packed vagina. The so-called cardinal ligaments, the broad fan-like expansions which anchor the vagina to the lateral pelvic walls and the floor of the pelvis are divided in their curved plane. As a rule there are no blood vessels in these ligaments. The gauze packing is next withdrawn from the vagina and a Bonney-Berkeley clamp is placed across it sufficiently clear of the growth but well above the line where the vagina is to be divided. Except in very early cases, practically all of the vagina is removed.

The regional glands are next removed, first with the areolar tissue outside the external iliac arteries up to the brim of the pelvis and then down the side wall of the pelvis to the level of the obliterated hypogastric artery. The forefinger is then pushed under the artery and the vessel raised up all the way from its origin from the anterior trunk of the internal iliac artery down to its disappearance at the cornu of the bladder. The artery is divided at the cornu of the bladder and the whole length of it, with the cellular tissue and glands already separated from the external iliac vessels, is resected to the internal iliac trunk. A ligature is then placed at its junction with the internal iliac trunk or on that trunk itself, and the mass, carrying with it the ligature originally placed on the proximal end of the uterine artery, is cut away. The extent to which this group of glands must be removed depends upon the conditions of the particular case. When the external iliac glands are obviously malignant or are believed to be involved by the malignant process, the common iliac glands must also be removed; occasionally it is necessary to go as high as the aorta.

Two other important groups of glands remain to be dealt with, namely, those occupying the obturator fossae. The excision of the obliterated hypogastric artery and the sheet of tissue and glands which have been described lays bare the obturator fossa, in which a mass of yellow fat will be found. The forefinger is inserted into the fossa under the external iliac vein and with this finger and forceps the mass is dislodged. Running through the mass is the obturator nerve, which should be spared. The fossa is left entirely empty down to the bare bone of the pelvic side wall.

The entire pelvis is then packed with about 2 ft. of gauze bandage soaked in a 1:1,000 solution of flavine, the lower end being pushed through the open end of the vagina to the vulva. This packing

is removed after twenty-four hours. The anterior peritoneal flap which was sutured to the lower end of the abdominal wound is liberated, and by means of a continuous catgut suture starting at the point where the left ovarioepelvic ligament was sutured, is attached to the peritoneum covering the posterior half of the pelvis and the bowel, the suture line ending at a corresponding point on the other side.

There is often a good deal of shock, especially in cases in which troublesome oozing continues throughout the operation. Many of the patients come to operation in poor condition. Blood transfusion and the intravenous use of saline solution are of great value in combating the shock. The after-treatment indicated is that given after any ordinary abdominal operation except that, as the bladder is paralyzed for a week or more, regular catheterization is necessary. The patient requires from two to three weeks to regain full control over the bladder.

The author usually takes from an hour to an hour and a quarter to perform the operation, but in some cases he has performed it in as short a time as twenty-seven minutes.

HARRY W. FINK, M.D.

Dieter, F., and Steffan-Elsen, I.: The Etiology, Frequency, and Treatment of Uterine Carcinoma. A Contribution to Statistics on Cancer for the Period from 1913 to 1924 (*Zur Ätiologie, Häufigkeit und Behandlung der Uteruscarcinome. Beiträge zur Carcinomstatistik 1913-1924*). München, med. Wchschr., 1930, 1, 2135, 2183.

The authors give statistics on the cases of cancer of the uterus treated by irradiation at the Gynecological Clinic of the University of Heidelberg in the period from 1913 to 1924. During this period, 446 cases of carcinoma of the cervix and 96 cases of carcinoma of the corpus of the uterus were treated by irradiation. The statistics are arranged to show the operability and frequency of the disease under special conditions, the relation of living conditions to the results of irradiation, the influence of childbearing on the incidence of carcinoma of the uterus, operability according to age periods, frequency according to age periods, the influence of age on the results of irradiation, the length of the period of treatment, and the cost of the treatment.

The statistics show first the absolute number of cures in the total number of cases of cancer of the uterus, including even those which for any reason were not given irradiation treatment, and then the absolute treatment response in the cases treated by irradiation. The corresponding relative figures are subdivided into those for operable and those for inoperable cases treated by irradiation.

The results in the cases of cervical carcinoma were as follows:

	No.	Per cent
Absolute number of cures	94:438	21.5
Relative number of cures, operable cases	69:177	39.0
Relative number of cures, inoperable cases	25:261	9.6

As 8 cases of cervical cancer were operated upon at once, the reckoning was made on the basis of 438 instead of 446 cases. The material on which the relative treatment response figures are based consisted of 31 fewer cases because 18 of the patients were incurable, 3 refused treatment, and 10 died before treatment could be begun.

	No.	Per cent
Absolute treatment responses	94:407	23.1
Relative treatment responses, operable cases	69:170	40.6
Relative treatment responses, inoperable cases	25:237	10.5

The operability of the total number of cases, including those which were operated upon, was 8 plus 177 or 185:446 or 41.5 per cent.

Of the 96 cases of carcinoma of the corpus, 4 were operated upon. Therefore the statistics are based on 92 cases. The results were as follows:

	No.	Per cent
Absolute number of cures in entire material	28:92	30.4
Relative number of cures, operable cases	28:83	37.7
Relative number of cures, inoperable cases	0:9	0.0

As all of the cases of carcinoma of the corpus except 1 were treated, the figures for treatment response and the figures for cure are identical. The operability was 87:96 or 90.6 per cent.

These results show that in cervical cancer irradiation is capable of giving at least as good results as operation. It must be remembered that the mortality of irradiation is less than the mortality of operative treatment, and that the cure of inoperable cases and of cases which for any other reason cannot be treated surgically is an absolute gain for irradiation.

Of special importance in the results was early diagnosis. Of the operable cases, 40.6 per cent, and of the inoperable cases, only 10.5 per cent, were cured. The poor results of the irradiation treatment of carcinoma of the corpus were attributed by the authors to technical defects. Therefore, after 1925, carcinoma of the corpus was treated for some time exclusively by operation. Only in the last year and a half has irradiation been resumed for this condition. The lesion is now irradiated with radium and in a special manner (radium bucket or triangle).

To determine whether carcinoma of the uterus has increased in frequency, the authors reviewed the entire clinically treated material for the period from 1906 to 1929. They found that the number of patients treated for any complaint whatsoever and the number of patients treated for carcinoma during this period steadily increased.

No relationship of the incidence of carcinoma of the uterus to nutrition, such as has been assumed by many, could be determined even during war. On the other hand, the results of irradiation therapy of cervical carcinoma were better in the cases of

patients in good circumstances (private patients) than in those of patients in poor circumstances (clinic patients).

	Private cases	Clinic cases
Operability.....	58.8	39.2
Absolute treatment responses.....	43.8	20.3
Relative treatment responses, operable cases.....	64.3	35.9
Relative treatment responses, inoperable cases.....	13.0	10.0

In the cases of carcinoma of the corpus this difference was not demonstrable. Similar results have been reported by Wintz and Voltz. No explanation can be given. In this connection the authors refer to the observation of Theilhaber, Voltz, and Kaufmann that cancer is much more common among the poorer classes than among the richer classes. The authors discovered that of 18,000 patients treated during the years from 1912 to 1929, carcinoma of the uterus was found in only 3.9 per cent of the women who were private patients and in 6.3 per cent of those who were clinic patients. The authors seek the reason for this—as have others—in the marked difference in childbearing in the 2 classes. Women who have given birth to many children seem to be especially predisposed to carcinoma of the cervix, as the authors demonstrate by means of a curve based on examinations of 6,000 clinic patients. Since the poorer classes as a whole produce more children, this should explain, at least in part, the higher incidence of carcinoma in these classes. It was found also that in the wealthier classes of patients irradiation therapy is more effective than among the so-called poor classes. The question as to whether the manner of living, especially the nutrition, is of importance in this connection is left open.

A study of operability in the different age periods disclosed the fact that the younger patients come to the physician at an earlier stage of their disease than the older patients. The authors' explanation for this fact is that the younger women are more easily influenced and pay more attention to the genital organs than women at the menopause.

The study with regard to the frequency of carcinoma of the uterus in the different age periods showed that cervical carcinoma is most frequent between the ages of forty-five and fifty-five years, whereas carcinoma of the corpus tends to appear on an average ten years later. This fact agrees with previous figures.

With regard to the influence of age on the results of irradiation therapy, the authors' findings differ from those of Voltz. The best absolute treatment response, 34.4 per cent, was obtained in the cases of patients between twenty-five and thirty-five years of age, whereas Voltz's figure for the same age class was only 10.9 per cent. Of the cases of women sixty-six years of age and older in the authors' series, good results were obtained in only 7.4 per cent, whereas of those of women of the same age in Voltz's series, good results were obtained in 13.5

per cent. The authors believe that this difference is due to differences in classification.

In conclusion the authors discuss the duration and the cost of treatment. When surgical treatment was given in the cases reviewed, the patient was confined to the hospital on an average of twenty-five days, whereas when radium treatment was given she remained in the hospital only twelve days. The cost of irradiation treatment is about 20 reichsmarks cheaper than the cost of operation. P. JONEN (G).

Babes, A.: Superficial Cancer of the Uterine Cervix (Sur le cancer superficiel du col utérin). *Gynéc. et obst.*, 1931, xxiii, 417.

The author describes the microscopic appearance of sections of the anterior lip of the uterine cervix throughout its thickness which were obtained from two cases of superficial cancer of the cervix. The epithelium covering the cervix was thickened unequally. In some areas in the sections from one of the cases it was double the normal thickness and in some areas in the sections from the other case it was three times the normal thickness. It appeared to have prolongations of varied thickness and depth.

The cells were no longer arranged in basal, mucous, and reticular layers. The epithelium was of uniform appearance and structure throughout except that the nuclei presented different characteristics in the deep, middle, and superficial layers. In the middle layer there were clusters of nuclei so close to each other that they seemed to be adherent.

The cells no longer had limits; hence they no longer had the proper shape or dimensions. The distance between the nuclei varied, but was generally less than the diameter of a nucleus. Most of the nuclei touched each other. Five types of nuclei could be distinguished: (1) round or oval nuclei with irregular edges, (2) fusiform nuclei, (3) polyhedral nuclei, (4) non-geometrical nuclei with a definite shape, and (5) non-geometrical nuclei with an indefinite shape. The nuclei varied in size from 3 to 24 micra. In structure they were granular, reticular, homogeneous, or vacuolar. They were hyperchromatic, orthochromatic, or hypochromatic.

The author cites Schaustein's case and three of Schiller's cases of superficial cancer. He states that in the case reports published up to the present time a detailed description is lacking, and that such a description is necessary for the differentiation between superficial cancer and epidermization of an erosion or a polyp. PAGE.

Mayo, C. H., and Mayo, C., 2d: Carcinoma of the Cervical Stump Following Subtotal Hysterectomy. *Ann. Surg.*, 1931, xciii, 1215.

Many opinions have been expressed as to the method or methods which should be used to prevent the development of carcinoma of the cervical stump following supravaginal or subtotal hysterectomy. Statistics as to the frequency of carcinoma of the stump of the cervix differ not only according to the

mata, multilocular cystadenomata, and cystic teratoma. Solid and partly solid tumors were classified microscopically as malignant, benign, and doubtful.

The following tumors occurred in the series:

	No.	Per cent	Total per cent
Multilocular pseudomucinous cystadenomata	71	33.8	53.0
Multilocular serous cystadenomata	42	20.0	
Adenocarcinomata, solid or cystic	23	10.9	
Papillary carcinoma (really cystic, but with extreme proliferation of the epithelium resulting in partial solidity)	12	5.7	20.8
Carcinomata of mixed type	5	2.3	
Other carcinomata of doubtful secondary type	4	1.9	
Cystic teratoma (benign)	22	10.4	24.6
Unilocular cystadenomata (g) and large follicular cysts (g)	14	6.6	
Fibromata (larger than normal ovary)	5	2.3	

In addition, there were 2 Krukenberg tumors, 2 solid teratomata, 2 cystic malignant teratomata, 1 adenofibroma (endothelioma?), 1 benign papilloma, 1 sarcoma, 1 endothelioma, 1 alveolar carcinoma, and 1 fibromyoma.

Approximately 88 per cent of all ovarian neoplasms of the solid or partly solid type were malignant.

Papillary disease was present in 43 per cent of the serous cystadenomata and in 14 per cent of the pseudomucinous cystadenomata. The tendency toward malignancy in these types was 61 per cent in the former and 50 per cent of the latter. External papillae were almost invariably an evidence of malignancy, while a papillary condition solely internal was of malignant character in approximately 38 per cent of the cases.

Ascites was present in 70 per cent of the cases of solid and partly solid malignant tumors, and was more frequent in cases of unilateral growths than in those of bilateral growths. Ascites was absent at the time of operation in 25 per cent of the cases of more or less solid malignant tumors. The presence or absence of ascites was no guide to the histopathology of these tumors. A similar conclusion was reached with regard to the multilocular cystadenomata of all types.

Torsion of the pedicle was found in 6.5 per cent of the total number of cases, but did not occur in cases of solid growths of a malignant type. Cystic embryomata were 3 times as liable to torsion as multilocular cystadenomata.

Adhesions were present in 50 per cent of cases of solid or semi-solid malignant tumors, but were absent in those of benign solid growths. Thirty-three per cent of the cystic teratomata and 50 per cent of the multilocular cystadenomata were more or less adherent.

Hæmorrhage into the tumor was 4 times as frequent in papillary as in non-papillary cystadenomata.

Suppuration occurred 13 times in the entire series of cases.

Pregnancy was associated in 2 cases with a benign teratoma and in 1 case with a unilateral malignant tumor. All of the women were primigravida.

None of the various types of ovarian tumors caused abnormal uterine hæmorrhage.

The majority of malignant tumors and non-teratomatous cysts were diagnosed at the menopausal age, and 80 per cent of the cystic embryomatous tumors were diagnosed between the ages of twenty and fifty years.

The author discusses the condition of the other ovary in cases of malignant tumor of 1 ovary. He points out that the value of operative statistics is decreased by the fact that the type of operation performed gives no more than a general indication of the degree of advancement of the disease.

ALICE F. MAXWELL, M.D.

MISCELLANEOUS

Reček, V.: Anatomical Findings in Cases of Genital Hemorrhage (Anatomischer Befund bei Genitalblutungen). *Čas. lek. čes.*, 1930, ii, 1669, 1714.

Last year, 447 women with pathological hæmorrhages from the genitals were observed in the Filzner Hospital. In 126 cases the cause of the hæmorrhages was evident even on macroscopic examination, being such a condition as tubal pregnancy, a fibromyoma, an inflammatory adnexal tumor, or an ovarian cyst. In 297, an exploratory curettage was necessary for diagnosis. Microscopic examination of the curetted tissue showed that in the cases of 61 women between thirty-five and fifty years of age the cause of the hæmorrhage was glandular hyperplasia. In 38 cases it was a disturbance of regeneration of the mucous membrane and delayed expulsion of the endometrium, and in 37 cases an endometritis following delivery or abortion. In 40 cases the endometrium showed the picture of a resting mucous membrane. Among these was a fatal case of bleeding at puberty. In 5 cases in which the findings of palpation were absolutely negative, endometrial tuberculosis was discovered.

Examination revealed chronic endometritis in 13 cases, atrophy of the endometrium in 32 cases, a hyperæmic mucous membrane with the glands in the proliferative stage in 8 cases, polyps of the mucous membrane in 14 cases, glandular erosion in 18 cases, carcinoma of the body of the uterus in 17 cases, carcinoma of the cervix in 13 cases, and sarcoma of the portio vaginalis in 1 case.

The incidence of malignancy was therefore relatively high, exceeding 10 per cent. Tuberculosis also was relatively frequent. A relationship between the duration and the severity of the hæmorrhage and the microscopic findings could not be determined. In 5 cases, islands of squamous epithelium were found in the endometrial stroma in the curettings.

In 11 cases conservative measures gave no results and removal of the adnexa was necessary. The extr-

pated ovaries contained follicular cysts of varying sizes, sometimes with a well-preserved layer of granulosa cells which in some instances showed marked proliferation. There were no corpora lutea. In all cases the mucosa of the body of the uterus was in a stage of marked hyperplasia. In only 1 case were necrotic islands demonstrable. E. GOLDBERGER (G).

Renner, M. J.: The So-Called Female Prostate and Concretion Formation in the Female Urethra. *Surg., Gynec. & Obst.*, 1931, lii, 1087.

Renner investigated the urethras and bladders of two museum specimens and six other female urethras for evidence of concretion formation. The existence of a female prostate has long found acceptance in theoretical medicine. The female urethra shows considerable resemblance to the male urethra, especially in its relationship to accessory glands, the genital tract, and Cowper's glandular bulbo-urethral glands.

In nearly all of the female urethras examined by the author, gland-like formations were to be seen. These represent, on the one hand, urethral ducts and, on the other hand, formations of the type of prostatic glands. The unilocular cysts and Skene's duct are to be considered as paraurethral glands. Acinous portions are of prostatic origin, especially when they are embedded in the smooth musculature. Corresponding to the colliculus seminalis, a submucous cyst is to be found in the female urethra surrounded by prostatic glands. The prostatic utricle is therefore present in a rudimentary form. The concretions found in the prostatic glands correspond morphologically and in their consistency to the concretions occurring in the male prostate.

These physiological and pathological anatomical findings are of importance because concretion formation in the muscularis mucosae may cause severe complications such as ulcers, phlegmons, and strictures. HARRY W. FINK, M.D.

Habbe, K.: A Contribution to the Question of Granulosa-Cell Tumors (Beitrag zur Frage der Granulosazelltumoren). *Zentralbl. f. Gynaek.*, 1931, lv, 1088.

The author reports thirty-four cases of granulosa-cell tumor, including four folliculoid, five cylindromatous, and twenty-four mixed folliculoid-cylindromatous tumors. The ages of the patients ranged from two to eighty years. The majority of the patients were between the ages of forty and sixty years. Irregular bleeding occurred in twenty-six cases, and hyperplasia of the endometrium was found in nineteen. In twelve, the uterus was not examined. A recurrence developed in four cases. Five of the patients died. Eighteen of the women are well and symptom free. Eight could not be followed up.

In his résumé the author says that granulosa-cell tumors develop at all ages, but are most frequently found in older women. In addition to the typical folliculoid and cylindromatous forms, we must dis-

tinguish at least three groups which are atypical and can be recognized as belonging to granulosa-cell tumors only by the demonstration of transitional forms between them and the typical forms.

The development of a granulosa-cell tumor is associated with hypertrophy of the uterus and hyperplasia of its mucous membrane; in many cases there is also swelling of the breasts. Irregular bleeding therefore occurs, sometimes after a preceding brief period of amenorrhoea.

The changes are attributed by the author to hormonal disturbances from overproduction of ovarian hormone or a similarly acting substance. Therefore the demonstration of these conditions is of diagnostic importance.

Metastases and recurrences after operation are relatively rare in cases of granulosa-cell tumors. The course of cases without operation is not well known. HANS O. NEUMANN (G).

Fellner, O. O.: Sixteen Years' Experience in the Therapeutic Use of Feminin (Die Feminitherapie auf Grund einer 16 jaehrigen Erfahrung). *Muenchen. med. Wchnschr.*, 1931, i, 139.

The author reports his results of treatment with feminin-oestranin, an ovarian hormone isolated by him. This is a lipid-soluble substance which can be dissolved in water only with great difficulty. It is present not only in the corpus luteum, but also in the interstitial cells, the tissues of the male and female genitalia, the adrenal cortex, the hypophysis, and the thymus, and in the blood and urine, especially of pregnant women. In rodents, it produces oestrus and enlargement of the uterus. It is dispensed in the form of tablets, rectal suppositories, and solutions for injection.

As a test of the effect of the preparation on the human female measurements of the uterine cavity are made. Suppositories were found to be the most effective, and small doses divided over several days were better than single large doses. A single injection of 300 mouse units into a rabbit weighing 1 kgm. increased the size of the uterus 0.5 c.cm. in five days, whereas daily injections of 60 mouse units produced an increase of 2.5 c.cm. and 20 mouse units injected 3 times daily resulted in an increase of 3.5 c.cm. Similar results were obtained with fractional doses in clinical cases.

The author discusses next the various functional disturbances of the female genitalia which were treated with feminin-oestranin.

1. Amenorrhoea (hypoplasia uteri). The results in this condition depend upon whether or not the uterine atrophy is far advanced. While the hormone may produce a single menstruation, the continuation of a spontaneous menstrual cycle depends upon the functional state of the uterus. Hormone therapy offers the greatest promise when it can be continued until the uterus regains its normal size as determined by measurements of the length of the uterine cavity, and when the amenorrhoea is only of short duration. The treatment must often be extended over a period

of weeks or months, and should be carried out not only by means of suppositories, but also by means of tablets and occasional injections. In this manner cures were obtained in 205 of a series of 296 cases. Obesity which accompanies amenorrhœa is not always secondary, but often a primary cause of genital hypofunction. For this reason treatment must be instituted to reduce weight during the period of hormone therapy. Ovarian treatment is without value in amenorrhœa from dysfunction of extragenital glands such as the thyroid or hypophysis. Hormone therapy should be attempted in cases of amenorrhœa with an overproduction of hormone. In such cases there is either a persistence of corpora lutea or an especially large production of corpus luteum substance which inhibits menstruation; instead of uterine atrophy, uterine hypertrophy is present. The author reports good results in 4 cases of this type.

2. Sterility. Hormone therapy should be continued only so long as the length of the uterus is diminished. On numerous occasions pregnancy has followed the course of treatment prescribed for amenorrhœa.

3. Menorrhagia. Hormone therapy is usually not indicated in this condition. A decrease in the bleeding in about 50 per cent of cases treated with hormone may be attributed to mere chance as it has not been explained scientifically.

4. Skin affections of ovarian origin. These responded favorably to the hormone.

5. Dysmenorrhœa. Especially favorable results were obtained from hormone treatment of this condition.

6. Underdevelopment of the mammary glands. The hormone may influence this condition favorably, as was shown in an experimental study on a fifty-year-old man which is reported by the author.

7. Menopausal disorders. These responded favorably to even very small doses of the hormone.

8. Sexual frigidity. In this condition good results were obtained, but the hormone should be administered shortly before cohabitation.

9. Obesity. The effect of the hormone on obesity depends upon the cause of the condition; if the obesity is due to the ovaries, good results may be obtained.

10. Postclimacteric arthropathy. Eight cases showed definite improvement after hormone treatment although they had been treated previously without result by other methods.

In experiments on animals in which hormonal sterilization was attempted, the author found that definitely larger doses than those used therapeutically were required. When smaller doses were used, nearly all of the young were females.

In attempts at rejuvenation with the hormone, subjective results were obtained.

There is no general contra-indication to the use of feminin, but it is not advisable to go beyond the usual dose of from 300 to 400 mouse units daily as the problem of hormonal sterilization is as yet imper-

fectly understood. Caution is necessary in the presence of tuberculosis as this condition may be activated by pregnancy. During pregnancy, the use of feminin is indicated for hyperemesis and mammary hypoplasia. It is contra-indicated in cases of threatened abortion, but does not produce abortion in a normal pregnancy. The increase of lactation caused by the ovarian hormone is as yet unexplained as it is believed that the onset of lactation coincides with a decrease in the hormone content of the blood stream.

F. SIEGERT (G).

Stahnke, E. N.: Analgesia in Operative Gynecology and Obstetrics (Über Schmerzbetäubung in der operativen Gynaekologie und Geburtshilfe). *Monatsschr. f. Geburtsh.*, 1937, LXXXVII, 144.

The material analyzed is that of the State Gynecological Clinic at Brandenburg for the period from 1917 to 1939. Of the 7,472 ether-chloroform narcotics (Roth-Draeger apparatus) induced during this time, 3,284 were for gynecological operations. Of 2,048 cases in which a laparotomy was done, death from the anesthetic occurred in only 3 (0.15 per cent) and death from pneumonia in only 1 (0.05 per cent). Of 2,287 curettages and evacuations of the uterus in cases of abortion, death attributable to the action of chloroform occurred in only 1 (0.05 per cent). In 1,901 obstetrical operations, including cesarean sections, there were no deaths from narcotics.

The postoperative pulmonary complications were studied with particular thoroughness. Postoperative pulmonary complications developed after 14.2 per cent of the total number of gynecological laparotomies. After vaginal operations their incidence was 3.5 per cent; after the Alexander-Adams operation, 10.35 per cent; after herniotomy, 14.8 per cent; and after evacuation of the uterus in abortion cases and after curettage, 1.4 per cent. In 609 obstetrical operations their incidence was 7.8 per cent.

In the author's opinion, these figures speak against a close relationship between postoperative complications and ether narcosis. The danger of postoperative pulmonary complications is much overrated by gynecologists. However, it is very important to take preventive measures against such complications before operation.

In discussing pernocton, the author warns against using a dose of more than 10 c.cm. In from 25 to 50 per cent of cases in which pernocton was employed he noted conditions of excitation.

Chloroform was used alone in about 100 of the cases reviewed. There were no deaths, but postoperative pulmonary complications occurred in 3.9 per cent. During delivery, chloroform appeared to be well borne.

In 336 cases in which avertin was used there was 1 death which was very evidently due to the narcosis and there were 2 deaths which may have been due to it (severe asphyxiation). In addition, severe asphyxia which did not end fatally occurred in 7 cases (2 per cent). Postoperative pulmonary complica-

tions developed in 15.14 per cent. The hope that pulmonary complications would not occur if avertin was used was therefore not fulfilled.

Spinal anaesthesia was induced with 5 per cent tropacocain in 226 cases. There was 1 death from anaesthetic shock but no nerve paralysis and no myelitis. An auxiliary narcosis was required in 17.7 per cent of the cases. Postoperative pulmonary complications developed in 13.3 per cent of the total number of cases and in 17.7 per cent of those in which a laparotomy was done.

The author states that there is no decided difference between anaesthetics as regards the frequency of pulmonary complications.

The question as to whether nitrous oxide anaesthesia is suitable for use in pregnancy has been answered variously in the literature. Nitrous oxide was employed in 104 of the cases reviewed. For laparotomies, ether was always necessary in addition. The technique of the induction of nitrous oxide anaesthesia is difficult. The results in caesarean section were not always satisfactory.

The author agrees with Franken that a comparison between various kinds of narcosis is possible only in relation to the same operation or the same class of operations. Gynecological laparotomies usually require a much deeper narcosis than vaginal operations and most other surgical procedures. In the development of pulmonary complications the site of the operative incision is not without importance. Pulmonary complications apparently depend, not upon the quantity of ether, but upon the duration of the operation. In the cases reviewed, no connection could be established between the frequency of postoperative pulmonary complications and the age of the patient. The severity of the illness appeared to increase somewhat with age. Pulmonary complications were most frequent in January and February and least frequent in September and October.

The author reviews the literature, including that on the subject of metabolic disturbances and the statistics for the different kinds of narcosis.

VON KNORRE (G).

PREGNANCY AND ITS COMPLICATIONS

Ewart: Accidental Antepartum Hæmorrhage—Clinical Notes. *New Zealand M. J.*, 1931, xxx, 165.

During the years from 1923 to 1928, inclusive, 168 cases of accidental antepartum hæmorrhage were seen at the Edinburgh Royal Maternity Hospital. During the same period 10,119 women were delivered and 24,234 patients were treated at the hospital. The incidence of the hæmorrhage was therefore 1.6 per cent calculated on the basis of the total number of deliveries and 0.7 per cent calculated on the basis of the total number of cases treated.

Of the 168 consecutive cases, 78.5 per cent, and of 100 cases especially investigated, 72 per cent, were those of multiparæ. The average age incidence was thirty and one-half years. There was 1 abortion in 10 pregnancies. The average parity of 134 multiparæ was 4.2 and the maximum parity 17. The average parity of 72 of the 100 multiparæ who were especially investigated was 4.1 and the maximum parity 15.

Of 82 cases of accidental antepartum hæmorrhage, albuminuria was present in 53 (64.63 per cent). In approximately 3 per cent of the total number of cases eclampsia developed. In 30 of 98 cases of accidental hæmorrhage albuminuria was present, but there were no other toxic symptoms. Of the 53 women with albuminuria, 39 were multiparæ and 14 were primiparæ. Trauma may have been a factor in 7 of 77 cases, but in only 2 cases was it a definite cause of the condition.

In 69 cases, the umbilical cord was measured. The average length was 20.2 in. and the minimum length 11 in.

In 98 cases the average period of gestation was thirty-four and sixth-tenths weeks. External hæmorrhage occurred in 72, combined hæmorrhage in 7, and concealed hæmorrhage in 6. In 14 cases the cause could not be determined.

The treatment was palliative and conservative except in 4 cases in which cæsarean section was done and 2 cases in which cæsarean section and hysterectomy were performed. One death followed each type of operation.

In 98 cases of accidental hæmorrhage there were 7 maternal deaths. Two of the women who died were moribund when they entered the hospital. In 1 of 2 cases in which vaginal packing was done, death resulted from septicæmia and in the other from peritonitis.

Of 86 children born in the hospital, 49 were still-born and 7 died soon after birth. The infant mortality was therefore 65.1 per cent. In the 6 cases of concealed hæmorrhage, the infant mortality was 100 per cent. In the majority of cases the death of

the child was due to asphyxia, prematurity, or cerebral hæmorrhage.

A Wassermann test was made in 12 cases. Syphilis was definitely present in 3 cases, possibly present in 4, and absent in 8.

In 8 cases, definite pathological infarction of the placenta was found, and in 6, placental abnormalities were present.

ROLAND S. CROX, M.D.

Osman, A. A., and Close, H. G.: Observations on the Plasma Bicarbonate and the Value of Alkalies in the Treatment of Some of the Renal Complications of Pregnancy. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 830.

The conditions reviewed by the authors did not include established eclampsia with convulsions. The treatment was based on the observation that the administration of sufficient doses of alkali by mouth to raise the plasma bicarbonate to normal and maintain it at the normal level resulted in a diuresis sufficient in degree and duration to rid the body of œdema, diminish considerably or clear up the associated albuminuria, and prevent the recurrence of these conditions. No dietetic restrictions of any kind were imposed. The authors believe that there is no reason for decreasing proteins. The total fluid intake was limited to from 3½ to 4 pt. in twenty-four hours. The alkali administered consisted of equal parts of potassium citrate and sodium bicarbonate, usually 50 gr. of each in 1½ oz. of water. As a rule it was found unnecessary to give more than from 600 to 700 gr. a day. The extent of the alkalization was determined from the amount of the diuresis and the reaction of the morning specimen. A rather remarkable degree of permeability of the kidney to alkaline salts in pregnancy was noted. This is important as it reduces the danger of alkalosis and tetany to the minimum. The authors believe there is no need to fear these complications.

Twenty-three women who had had pregnancy toxæmia in previous pregnancies were treated prophylactically by the method described. Only four had a recurrence of albuminuria. Therefore it may be possible to diminish the incidence of pregnancy toxæmia by alkali therapy.

The authors conclude that alkali therapy is of value in the control of œdema and albuminuria of pregnancy and pre-eclampsia. It obviates the necessity for sweating and permits the use of a more adequate diet.

On the other hand they believe that alkali therapy alone will only diminish the severity of some of the symptoms of the toxæmias of pregnancy and cannot be relied upon to prevent the onset of some of the graver symptoms in all cases.

GOODRICH C. SCHAUFFLER, M.D.

LABOR AND ITS COMPLICATION

Winter, G.: The General Indications for Abdominal Caesarean Section (Die allgemeinen Indikationen zum abdominalen Kaiserschnitt). *Monatsschr. f. Geburtsh.*, 1931, lxxvii, 3.

According to Winter, caesarean section is indicated only in the presence of a constant complication which renders delivery mechanically impossible (contracted pelvis, stenosis, atresia, malformation, obstructing tumor), or when the lives of mother and child are threatened (eclampsia), or when labor cannot be terminated by a simple, harmless operation. In sharp contrast to this point of view are the 63 indications which were noted by Winter in his statistical study of caesarean sections performed in 1928.

An expectant attitude and simple vaginal operations have been more or less abandoned. Winter gives 5 reasons for this state of affairs. The most important are the decreasing exactitude in the determination of the indications for this operation and purely personal reasons, especially of surgeons and surgeon-gynecologists who have not mastered the technique of vaginal surgery and who performed the great majority of caesarean sections in 1928 (1,430 in a total of 2,608). For this reason Winter attempts to summarize the indications.

As caesarean section performed at the earliest possible moment has the best prognosis, Winter says that we must attempt to combine early and accurate determination of the indications with the safety and good prognosis of early section. This is rendered difficult by the fact that the fetal mortality of caesarean section is much lower than that of vaginal operations, surgeons therefore tending to extend the indications too far in the interests of the child and thereby subject the mother to added danger. However it is an old and important obstetrical principle that the sacrifice of the unthreatened individual for the individual threatened is permissible only on maternal indications and never on fetal indications. The life of the mother is always regarded as of greater importance than that of the child.

Of special interest are caesarean sections in the presence of infections of the uterine cavity. It must be determined in such cases whether the extraperitoneal section or the method of Doerfler will give the best results. In infected cases, Doerfler brings the entire uterus outside of the abdominal cavity, reflects the peritoneum, and after performing a caesarean section, covers the small incision with 3 layers of peritoneum, and then returns the uterus to the abdominal cavity. Winter points out the important fact that neither the bacterial content of the uterus nor the fever which results from the presence of bacteria in the amniotic fluid always leads to a localized or generalized postpartum infection. In a great number of his cases with a definite bacterial invasion the convalescence remained afebrile. However, it is impossible to foretell the result. As a bacteriological diagnosis is not yet possible, a concerted effort must be made to perfect clinical prognosis.

Winter classifies infected cases into 4 groups and believes it would be very desirable to use his classification for other statistical studies. The mortality of caesarean section in the presence of fever varies so greatly at present that it is difficult to formulate a definite opinion on the subject. H. FÜRST (G).

MISCELLANEOUS

Ehrenfest, H.: Factors and Causes of Fetal, New-born, and Maternal Morbidity and Mortality. *Am. J. Obst. & Gynec.*, 1931, xxi, 867.

A tremendous loss of life occurs during the first few months of intra-uterine existence. The mortality during the six months preceding viability apparently surpasses the total mortality from that time to the age of sixteen years.

All attempts to enforce systematic reports of abortions to health officers have failed. No data concerning the incidence of abortion are available for the United States. However, the author believes that about 25 per cent of all maternal deaths related to childbearing follow abortion, and that 91 per cent of those following criminal abortion are due to septicæmia.

The responsibility of discovering syphilis in pregnant women rests largely with the general practitioner. The fact that a negative Wassermann test does not exclude the presence of this disease should be more generally known.

The theory that pregnancy has a deleterious effect on pulmonary tuberculosis is today finding less general acceptance. The satisfactory solution of the important problem of dealing with tuberculosis in pregnant women depends mainly on an adequate number of hospital beds for cases of this condition. The most important single factor is recognition of the tuberculous lesion very early in pregnancy.

Of serious importance is the relative frequency of chronic nephritis following eclampsia, pre-eclamptic toxæmia, and the so-called albuminuria of pregnancy.

In cases of cardiac disease complicated by pregnancy it is necessary to recognize the cardiac condition early and institute measures to prevent a circulatory breakdown. No attempt at delivery should be made while there is acute decompensation.

Since the introduction of modern methods of dealing with functional anomalies of the thyroid gland, interruption of pregnancy on account of a thyroid condition is rarely necessary. Hypothyroidism can be effectively managed by the administration of thyroid extracts.

In cases of diabetes, the prognosis for both the mother and fetus has been greatly improved by the use of insulin.

Slight anæmias are relatively common in pregnancy, especially in the later months, but severe anæmias are infrequent.

Parasitic diseases cause many abortions or premature labors, but with the exception of hookworm disease, do not constitute an unusual hazard for

the mother. Malaria causes abortion, but if the malaria is treated with quinine abortion is prevented.

Most exhaustive investigations have demonstrated beyond all reasonable doubt that pre-conceptional irradiation is harmless to a future child, but that the post-conceptional application to the pelvic region of radium or the X-rays for therapeutic purposes is associated with great danger to the fetus, especially the fetal central nervous system. Therefore irradiation should always be preceded by curettage. It is probable that a short exposure for roentgenograms during pregnancy is entirely free from harmful effects on the fetus if it is not too often repeated, especially in early pregnancy.

Difficulties likely to arise from pelvic anomalies and abnormal fetal presentations can often be foreseen by careful antenatal examination and continued observation. The close relationship of injury of the child in birth to its immediate or early death or a later physical or mental deficiency is recognized. With the increase in our knowledge regarding the immediate and late effects of such injuries there has been a decrease in the reports of so-called congenital diseases and anomalies of infants, as it has been found that many of these conditions are acquired at birth. Responsibility for these injuries does not necessarily rest with the obstetrician, but their occurrence is certainly influenced to a considerable extent by his judgment and skill. Advocates of the more radical obstetrical procedures seem to disregard or to minimize the inevitable dangers of these practices.

Artificial delivery is becoming increasingly frequent, especially in hospital practice, chiefly as the result of four factors: (1) a sense of safety, often false, (2) the almost universal use of anesthetics in response to the demands of patients; (3) an exaggerated idea of the value of the infant's life and of operative delivery in conserving this life; and (4) the often false idea that artificial delivery is easier on the mother.

The relief of pain in labor is desirable, but the problem is essentially different from that of the anesthesia required for operations. Among the various types of inhalation anesthesia, nitrous oxide with oxygen is probably the safest and most satisfactory, and ethylene with oxygen is next best. The latter is of value also for the deeper anesthesia required for operative deliveries, but under certain conditions can be advantageously replaced by block or local anesthesia. With every type of analgesia or anesthesia during labor the effect upon the fetal heart must be noted.

Efforts at resuscitation of the fetus must be gentle. Brusque manipulations not only tend to aggravate already existing lesions, but are responsible for various types of often serious traumatism. Whenever an intracranial injury is suspected, 20 c.cm. of parental blood should be injected hypodermically as a prophylactic measure.

Puerperal morbidity statistics as now offered from various sources cannot be compared with each other

and are of only limited practical value. The morbidity in large maternity hospitals in the United States with standards approximately the same varies from 7.6 to 30 per cent.

Allowing doctors in the community to care for their own patients in the hospitals provided they rigidly adhere to the established technique has generally proved advantageous.

The present maternal mortality and morbidity from inadequate intranatal care, trauma, and infection will be best reduced by more and better equipped maternity hospitals with a better trained personnel, reduction of operative deliveries, measures to prevent the abuse of analgesia and anesthesia, and better education of mothers with regard to the advantages of good antenatal care and the inevitable dangers of satisfying their desire for painless and short labor.

Young women suffering from certain forms of cardiac, renal, endocrine, infectious, malignant, or mental diseases should be advised against marriage. It seems logical that the physician should suggest and, on request, should give information with regard to known contraceptive methods. However, this should always be done with the warning that no fully dependable method is known to the medical profession.

Appropriate changes should be made in official birth and death certificates so that more information can be obtained concerning the causes of maternal and infant deaths related to pregnancy and birth.

E. L. CORNELL, M. D.

Solomons, B., Smyth, G. S., Dowse, R. V., Bourke, F. S., and Others: Reports of the Rotunda Hospital, November 18, 1929, to October 31, 1930. *Rep., Rotunda Hosp.*, Dublin, 1929-1930.

During the year 1929 to 1930, 2,780 women were admitted to the obstetrical service of the Rotunda Hospital. Two thousand, two hundred and fifty-eight were delivered in the hospital and 1,724 were delivered at their homes by members of the hospital staff. The total number of deliveries was therefore 3,928. No deaths occurred in the extern department. Women with accidental hemorrhage and eclampsia were admitted to the hospital. In the calculation of the mortality, the 2 departments were taken together.

The value of the Gwathmey method of inducing anesthesia and of the Fouchet reaction in toxemia, the time of the fixing of the head in primigravidae, and the histology of the placenta are discussed.

Of the 41 infants which died in the hospital, 36 died within the first eight days. Three died of melæna. Underpinning of the cord saved the lives of 3 babies. This is the only method by which life may be saved when hemorrhage occurs from the stump of the cord.

Six hundred and twenty-nine women in addition to those with eclampsia and eclampsism had albuminuria at the time of their admission to the hospital. Solomons suggests that albuminuria may

sometimes be normal in pregnancy. Of the 37 cases of eclampsia reviewed, 3 were fatal. These cases are discussed in detail. There were 8 cases of eclampsia. All were very severe even though the number of convulsions was not always high. Three of the women with eclampsia died from cerebral hæmorrhage. The hæmorrhage was demonstrated at autopsy. In the 8 cases of eclampsia there were 5 live babies.

Accidental hæmorrhage occurred in 41 cases. In the 26 which were toxæmic there was 1 maternal death, but in the 15 others there was no maternal mortality. Of the 26 babies delivered in the toxæmic cases, 23 were stillborn, whereas of the 15 babies in the other cases only 4 were stillborn. Toxæmia with accidental hæmorrhage is a serious condition. The treatment consisted of expectant management, puncture of the membranes, puncture of the membranes and the administration of pituitrin, cæsarean section, the use of forceps, or traction on the breech. In 7 of the 26 cases the condition had occurred in previous pregnancies.

In the 19 cases of placenta prævia there were no maternal deaths. Ten of the babies were born alive. In 3 cases cæsarean section was done. According to Hill, bipolar version is the best treatment.

There were 110 cases of disproportion. Thirty of the infants were delivered spontaneously.

In the 23 cases of uterine inertia, there was 1 maternal death. One woman delivered herself spontaneously after fifty-four hours of labor. Twenty women were delivered with forceps. There were 2 infantile deaths. In uterine inertia the use of morphine and the avoidance of oxytocic drugs are indicated.

Cæsarean section was done in 44 cases and cæsarean section followed by hysterectomy in 1 case. The classical cæsarean section was performed 23 times and the low operation 20 times. In 18 cases a previous cæsarean section had been performed. In 14 of these the previous operation had been of the classical type, and in 4, of the low type. All of the mothers and babies survived. In accidental hæmorrhage cæsarean section is practically never necessary and may be fatal. In a case of toxæmia in which cæsarean

section was performed the patient died. Of the 16 low cæsarean sections, 5 were performed for disproportion. One patient with inertia died. Two were delivered following a previous section.

The forceps were applied in 137 cases (6 per cent). One hundred and nine of the women were primigravida. Eight of the infants were stillborn. In 5 of the cases in which the infant was stillborn there was disproportion, and in 3 there was prolapse of the cord. In 32 cases the forceps were used on account of fetal distress.

Induction of labor by the oil-quinine method was done in 38 cases with 1 fetal death. Of the 34 bougie inductions, 22 were for disproportion. Puncture of the membranes was done at least one month before full term, and in nearly all cases of accidental hæmorrhage and hydramnios.

The occiput was persistently posterior in 15 cases, but this position did not cause trouble.

The incidence of morbidity was higher than in the year 1928 to 1929, the percentage according to the British Medical Association standard being 5.27. Morbidity occurred in 119 cases. In 41, it was operative, and in 45 was apparently due to extrapelvic causes. The mortality based on the intern and extern statistics together was high for the Rotunda Hospital—0.55 per cent (22 deaths). The mortality in the indoor service alone was 0.97 per cent. Fourteen deaths were due to obstetrical causes and 8 to non-obstetrical causes. Practically none of the patients had prenatal care. There were 3 cases of sepsis.

The gynecological department admitted 801 cases. Sixty-six hysterectomies were performed. Of these, 41 were total, 21 were subtotal, 3 were of the Wertheim type, and 1 was a vaginal hysterectomy. Total hysterectomy is the procedure of choice when the cervix is involved by erosion or ectropion and when there is leucorrhœa. The ovaries are left *in situ* if they are normal. The authors believe that in carcinoma of the cervix radium gives the best results. The low incidence of cancer in the cases reviewed is attributed to better midwifery, the practice of repairing the cervix in all secondary tears, and the treatment of all except simple erosions by partial amputation.

ROLAND S. CRON, M.D.

Of 411 cases of tumors of the bladder which came to autopsy, gross metastasis was found in 133 (32.36 per cent).

In a book published by Watson and Cunningham in 1908, 287 surgically treated cases of benign papillomata were reported. The methods of treatment included cauterization, snaring, and curetting. The mortality was 10 per cent. A recurrence developed within three years in 20.4 per cent and after three years in about 20 per cent.

Beer recently reported 33 cases of benign papilloma not suitable for cystoscopic treatment which were treated with the high-frequency current introduced through a suprapubic incision. The mortality was 12 per cent and a recurrence developed in a period of eight years in 15 per cent of the cases. Of 31 cases treated by Geraghty, a recurrence developed in 80.64 per cent. In 18 cases treated by the author, the mortality was 8 per cent and the incidence of recurrence in three years was 10 per cent.

The treatment of benign tumors with Beer's method of fulguration through the cystoscope is a vast improvement over the older methods. In 237 collected cases treated by this method there was only 1 death and a recurrence developed in only 37.

Of 279 cases of carcinoma of the bladder treated by Watson and Cunningham without resection before 1908, a recurrence developed in three years in 65 per cent. At the time these cases were treated radium and diathermy were not in use. In 35 cases treated by Young by modern methods there were 21 deaths from recurrences and 5 recurrences without death. Of 38 patients treated suprapubically by the author, 6 died in the hospital and 26 died within two years. All of these patients had advanced tumors.

In 96 cases of carcinoma of the bladder in which Watson and Cunningham performed a resection, the mortality was 21.8 per cent and the incidence of recurrence 56.1 per cent. In 28 cases of papillary carcinoma in which Beer performed a partial or complete resection the mortality was 14 per cent and the incidence of recurrence 25 per cent. Of 37 patients with an infiltrating carcinoma, 21 per cent died and 43 per cent developed a recurrence. In the cases of 4 patients who were given preliminary X-ray treatment recurrence did not develop, but operation was more difficult than in the others. In 54 cases treated by resection by Young there were 5 deaths and the incidence of recurrence was 59.25 per cent. In 26 cases in which the author performed a resection the results were about the same. The author believes that resection is the procedure of choice. He states that in the prevention of recurrence little progress has been made.

During recent years Coffey's work on uretero-enterostomy has revived total cystectomy, but further improvement in this operation is necessary.

The new methods employed—radium and X-ray irradiation and diathermy—have been in use long enough to warrant conclusions regarding them. Barringer has used radium emanations through the cystoscope and suprapubically for several years.

In 90 cases so treated there were 3 deaths. Of 20 patients with papillary carcinoma, 11 remained free from recurrence for more than five years. Of 51 patients with an infiltrating carcinoma, 12 remained free from recurrence for more than five years. Of 28 cases in which Young used radium emanations, a recurrence developed in 22. In 75 per cent of these cases the lesion was not resectable. Of 49 cases of tumor of the bladder (2 were benign) in which Young used radium through the cystoscope, a fatal recurrence developed in 31. Young believes that the best results are obtained with combined fulguration and irradiation. In 31 advanced cases in which Beer used Barringer's method, there were no deaths.

The use of radon seeds or radium element through the cystoscope combined with fulguration seems to the author to give the best results. Beer obtained 9 cures in 16 cases treated by this method. In 8, the growth was poorly located for the implantation of seeds.

The X-ray has been of little practical value in the treatment of bladder tumors. Diathermy is still in the experimental stage. It is based on sound principles, but its results have not been satisfactory. When radium is not available, it may be employed for sloughing growths and in treatment preliminary to resection.

CLAUDE D. PICKRELL, M.D.

Darger, R.: Radium Therapy of Malignant Tumors of the Bladder. Results Obtained in Twenty-Three Cases (*La radiumthérapie des tumeurs malignes de la vessie: résultats obtenus dans 23 cas*). *Bordeaux chir.*, 1931, iii, 186.

Although various types of cystectomies and hemi-cystectomies have been performed in the treatment of malignant tumors of the bladder, surgery is now used only in the form of cystotomy to permit physical therapy. Two methods are employed: (1) electrocoagulation through the open bladder (method of Beer and Heitz-Boyer), and (2) radium therapy by the implantation of needles or tubes of radium. In France, electrocoagulation is employed more frequently than radium therapy, but in America, radium therapy is preferred to electrocoagulation.

The author reports his experiences in the treatment of twenty cases of malignant tumor of the bladder with radium after cystotomy and three cases in which radium was introduced with the aid of a sound in the urethra.

In the discussion of the end-results, the cases of ten patients are excluded because of the presence of an associated condition or because the tumor of the bladder was far advanced at the time of treatment. Of the thirteen remaining patients, one died from uræmia two months after treatment; one, several months after treatment from a recurrence; one, a year and a half after operation; one from progressive anæmia and girdle pains probably due to deep metastases to the lymph glands; one, four years after

treatment by suicide induced by mental trouble; and one, after five years without the occurrence of hæmaturia. In nine, the treatment evidently resulted in cure. Seven patients were well when last heard from—after seven years, six years, five years, two and a half years, twenty-eight months, two years, and thirteen months respectively.

The author finds that radium is well tolerated. However, in cases in which it has been left for more than seven days a certain amount of retraction with a reduction in the capacity of the bladder to about 70 c.cm. has been noted.

Lymphocytic infiltration of the tumor is a favorable sign.

In discussing the technique of the treatment the author states that it is necessary to implant the radium in the base of the tumor. He believes that some of the failures of the treatment have been due to improper application of the radium. After opening of the bladder and superficial destruction of the exuberant masses of tumor by diathermy coagulation, radium needles containing 3 mgm. of radium element and filtered with $\frac{1}{2}$ mm. of platinum should be introduced $\frac{1}{2}$ mm. apart in the arrangement of the spokes of a wheel and firmly fixed. To aid in keeping the needles in position, the author puts in a gauze pack or a rubber balloon with a capacity of 70 c.cm. which is filled with an antiseptic solution. The treatment should be prolonged long enough to have a destructive action on the tumor without injuring the bladder. The average duration of the treatment is four or five days, but in severe cases it is from seven to eleven days. Care must be taken to prevent infection of the bladder. To prevent infection, the author irrigates the bladder with a solution of mercurochrome. After the treatment he examines the patient every three or four months for eighteen months, and thereafter at intervals of six months.

Darget concludes that radium is capable of curing cancer of the bladder. He states that to evaluate the efficacy of mesothorium and the electrocuprol treatment suggested by Nabias, further experimentation is necessary.

JACOB E. KLEIN, M.D.

Learmonth, J. R.: Neurosurgery in the Treatment of Diseases of the Urinary Bladder. *J. Urol.*, 1937, xxv, 537.

With the exception of the inconsiderable filaments which join the hypogastric ganglia directly from the sacral paravertebral sympathetic chains, the great majority of the sympathetic nerves reach the bladder by way of the presacral nerve. The technique of surgical interruption of the presacral nerve has been more or less standardized. For this operation Learmonth uses the left paramedian incision, making a third of it above, and two-thirds of it below, the umbilicus. He has found that the packing off of the intestines to expose the posterior abdominal wall is greatly facilitated by spinal anesthesia. When the packs are in position they delimit the lower part of the abdominal aorta from the insertion of the mesen-

tery of the small bowel downward to the bifurcation, the two common iliac arteries, the left common iliac vein, part of the anterior surface of the fifth lumbar vertebra, and the promontory of the sacrum.

The peritoneum over the promontory is picked up and incised in a vertical direction to the upper limit of the exposure and each lip of the peritoneal incision is carefully retracted. In this way the inferior hæmorrhoidal artery is excluded from the field. In the cases of lean subjects it is usually possible to identify the strands of the presacral nerve before the peritoneum is incised. In the cases of fat subjects, Learmonth has been in the habit of working from the left side to the right. A little search is enough to identify a strand as it passes over the left common iliac vein. This strand is placed on a blunt hook, and as further strands are identified, first toward the median line and then toward the right common iliac artery, they are in turn placed on the hook. At the conclusion of the dissection the common iliac arteries and the left common iliac vein are denuded of nerve fibers. The nerve is then divided between ligatures, as high as possible. The peripheral end is raised by blunt dissection with a cotton pledget, and any communicating fibers from the lower lumbar ganglia are severed during this process. According to Learmonth's experience, the latter most frequently join the posterior aspect of the composite nerve. As soon as the hypogastric nerves are reached, each is clamped and divided proximal to the clamp and the segment of nerve is removed. The clamps on the hypogastric nerves are then replaced by ligatures. Rarely has it been necessary to place ligatures on vessels in the tissue from which the nerve has been removed. The wound in the posterior peritoneum is closed with a fine suture of catgut and the abdominal opening is closed in the usual manner.

The parasympathetic nerves are very difficult to expose in their course from the sacral nerves to the hypogastric ganglia. Interference with the ganglia themselves is dangerous on account of their intimate relationship to the rectum and the larger blood vessels of the pelvis. The surgeon who wishes to interrupt the parasympathetic supply to the bladder must perforce attack the efferent branches of the hypogastric ganglia. As these nerves include both sympathetic and parasympathetic fibers, the operation becomes a subtotal denervation of the bladder.

For subtotal denervation of the bladder, Learmonth has employed the transperitoneal route described by Rochet and Latarje in 1913. A median subumbilical skin incision is made, the recti muscles are separated in the median line, and the upper portion of the fundus of the bladder is freed extraperitoneally so that it can be used later as a tractor. The peritoneum is then opened, and the lateral wings of a self-retaining tractor are adjusted. The best exposure for the rest of the operation is obtained by the highest possible Trendelenburg position.

After packing off of the intestines, which is facilitated by spinal anesthesia, each ureter is identified at the point where it crosses the iliac artery, the

determining glomerular damage. In tubular damage, as in surgical disease of the kidney, especially that resulting from obstruction, visualization is increased by retention and concentration of the contrast substance. Kidney function can be judged by the time of appearance and the intensity of the renal shadow.

In unilateral renal disease excretion urography will show not only which kidney is diseased, but also the function of the diseased organ. As the excretion urogram reveals also the anatomical factors on which operative indications are based, it is all that is needed except when, because of severe damage, there is no visualization. Under the latter conditions, instrumental urography is necessary.

In bilateral renal disease due to peripheral causes (prostatic obstruction or stricture), intravenous urography is sufficient.

In the diagnosis of kidney disease due to changes in the dynamics of the urinary tract or transportation of the urine this method is of the greatest importance. Any attempt to increase visualization by compression disturbs the physiological processes and produces urograms which resemble those produced by peripheral obstruction.

Excretion urography shows the normal renal pelvis with its constantly changing contour and makes possible also the visualization of the rest of the kidney.

Von Lichtenberg discusses and compares 5 new opaque media and the 2 old substances, uroselectan and abrodil, which are used in intravenous urography. All of the new substances appear to be superior to uroselectan and abrodil in every respect, i.e., toxicity, quantity eliminated, solubility, local and general reactions, ease of administration, rapidity of elimination, and concentration in the urine. In the new substances only from one-fifth to one-third of the previous amounts of iodine are injected. This seems to prove that a large amount of iodine is not necessary for excretion urography.

In tuberculosis of the kidney, excretion urography is of great value in both the diagnosis and the later check-up.

In the diagnosis of renal tumor excretion urography has no advantages as the purpose of the X-ray examination is to determine only the anatomical changes.

In cases of anomalies, excretion urography has been of little aid.

In the diagnosis of ureteral conditions such as stricture and kinks, excretion pyelography is especially applicable. A ureteral stricture or a kink is always at the same place and its conformation remains the same in successive urograms. Ureteral disease from infections of the genital organs are also well brought out by excretion pyelography.

Excretion urography is of great value in the treatment of ureteral stone. As the utmost conservatism is necessary in this condition, a knowledge of all of the anatomical details and relations and of the functional condition and dynamics of the renal pelvis and the ureter is essential.

In the treatment of hydronephrosis the indications should be based, not on the size of the retention tumor, but on the functional condition and the state of the dynamics of the urinary tract. The intravenous urogram is of the greatest importance. The opaque medium used should be one which, when eliminated in weak concentration, produces distinct shadows. In hydronephrosis, uroselectan is superior to the newer opaque media.

Cystography is greatly facilitated by the intravenous use of contrast substances. Diverticula, stones, and the changes due to prostatic hypertrophy are easily visualized.

Of the five new substances, D 40 or Uroselectan B was found to be the best in all respects.

ANDREW McNALLY, M.D.

Ravassini, G.: Pharmacological Research on Uroselectan (Ricerche farmacologiche sull'uroselectan). *Arch. ital. di urol.*, 1931, vii, 514.

Ravassini studied the excretion of uroselectan by the kidney, liver, and intestines in rabbits. He noted that the maximal portion of the drug injected intravenously was eliminated in the urine, whereas a small amount was excreted in the bile and intestine. The excretion in the urine was very rapid, more than 90 per cent of the total amount excreted being found in the urine within the first six hours after the injection. When small doses were used the uroselectan was usually eliminated completely in twenty-four hours, whereas when larger doses were administered its complete elimination required four or five days.

The absolute quantity of uroselectan excreted in the urine increased with the increase in the dose injected, but the relative amount of the drug excreted decreased with the increase in the dose. The author believes that larger doses impair renal function so that more of the uroselectan is eliminated in the bile and intestine.

Ravassini did not find any evidence of decomposition of the uroselectan with the liberation of iodine.

PETER A. ROSI, M.D.

Benassi, E.: Experimental Researches on the Toxic Effects of Uroselectan (Ricerche sperimentali sugli eventuali effetti tossici dell'uroselectan). *Arch. ital. di urol.*, 1931, vii, 522.

In studies of the effect of uroselectan made on rabbits and dogs, Benassi noted that the intravenous administration of doses equivalent to the dose used clinically (0.60 gm. per kilogram of body weight) produced no histological lesions in any of the parenchymatous organs. Doses as much as ten times the clinical dose produced mild regressive degenerative changes such as congestion and cloudy swelling of the renal parenchyma and myocardium, and similar but less pronounced changes in the liver. These lesions were transitory and completely disappeared after several days. Massive doses equivalent to fifteen times the clinical dose were not fatal.

Benassi concludes that the toxicity of uroselectan is sufficiently low to permit the use of the drug in

cases of renal lesions. In subjects with apparently normal kidney function larger doses may be given safely if this is necessary to obtain more contrast in pyelograms.

PETER A. ROSI, M.D.

McCarrison, R.: The Causation of Stone in India.
Brit. M. J., 1931, i, 1009.

In experiments carried out on albino rats a diet consisting of oatmeal, linseed, corn flour, calcium phosphate, sodium chloride, and distilled water produced stones in the urinary tract and a very grave form of anæmia. When the oatmeal was replaced by whole wheat flour, the incidence of stone formation increased from 8 to 22 per cent. White flour was found to be a less potent cause of stones than whole wheat flour. Deficiency of Vitamin B was not a factor in stone formation. The substances most frequently causing stones, given in order of decreasing importance, were whole wheat flour, millet grown in the northern part of India, white flour, and rice. Millet grown in the southern part of India did not produce stones. When whole milk, butter, or cod liver oil was added to a stone-producing diet, the formation of stones was completely prevented. Vegetable oils did not prevent stone formation.

From these experiments it was concluded that an important cause of the formation of stones is a

deficiency of Vitamin A. When calcium was added to a diet deficient of Vitamin A, the incidence of stones was increased. Another important factor in stone formation is calcium-phosphorus imbalance.

Four types of stone may be produced experimentally: ammonium-magnesium-phosphate stones, calcium-carbonate stones, calcium-hydroxide stones, and stones composed of a mixture of calcium carbonate and calcium hydroxide.

The dietary factors causing stones are an excess of calcium, some unknown agent present in whole cereal grains, a deficiency of Vitamin A, and a deficiency of phosphates relative to the amount of calcium in the diet.

The composition of stones from clinical cases was as follows:

	Number	Per cent
Pure uric acid.	15	6.63
Pure oxalate	13	5.75
Pure phosphate.	3	1.32
Phosphate-oxalate.	23	10.17
Urate-phosphate.	20	8.85
Urate-oxalate.	78	34.51
Urate-oxalate-phosphate	74	32.75
	<hr/> 226	<hr/> 99.97

J. SIDNEY RITTER, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Wagoner, G., and Cohn, B. N. E.: *Osteochondritis Dissecans: A Résumé of the Theories of Etiology and the Consideration of Heredity as an Etiological Factor.* *Arch. Surg.*, 1931, xliii, 1.

According to one of the two most generally accepted theories, osteochondritis dissecans is due to trauma. According to the other, it is an aseptic bone necrosis caused by a vascular disturbance. According to a third theory, it is the result of trauma combined with a predisposition. The authors define it as a non-infectious process involving the articular cartilage and the subchondral bone of certain long bones of the extremities which, by sequestration from the articular surface, usually produces a single foreign body and, more rarely, two foreign bodies of the contiguous joint. The foreign body is originally of an osseocartilaginous composition, but its structure subsequently undergoes alteration by the fluids in the joints. The site most frequently involved is the mesial half of the articular surface of the internal femoral condyle, but the process may occur also in the heads of the radius, femur, and humerus. The condition occurs most frequently in tall, rapidly growing boys.

The authors report three cases of osteochondritis dissecans of the knee occurring in one family and two cases occurring in another. In the first family the condition was found in a boy, his father, and a paternal uncle. In the other it occurred in two brothers. In one of the brothers it was bilateral. The authors conclude that heredity is a factor in its occurrence.

CHESTER C. GUY, M.D.

Well and Massart: *The Arthropathies of Hæmophilias* (*Les arthropathies des hémophiles*). *Rev. de chir.*, Par., 1932, I, 199.

Joint complications associated with hæmophilia occur chiefly in adults. Hæmophilias with a coagulation time under an hour usually do not suffer from arthropathies incident to their condition. In the case of a young child whose first manifestation of hæmophilia is a joint lesion the prognosis is serious. Hæmophilic arthropathies are not spontaneous; they result from minor traumata and tend to recur with a certain periodicity.

The authors distinguish between familial and sporadic acquired hæmophilia. In the first condition the hæmarthrosis may be an isolated phenomenon; in the second, the absorption of blood from the affected joint may lead to hæmorrhages elsewhere, such as hæmaturia.

Any joint may be involved. When only one joint is involved it is the knee, but knee involvement is

often accompanied by hæmorrhages in the elbow and shoulder and less often by hæmorrhages in the ankle, hip, or wrist. The stages of the arthropathy are usually: (1) hæmarthrosis, (2) arthritis with thickening of the synovia and limitation of joint movement, and (3) deforming conditions or contractions of the joint with loss of all movement. This corresponds to Koenig's syndrome: hæmophilic hæmarthrosis, hæmophilic panarthritis, and articular deformity.

The two last conditions are found in untreated patients. According to Carrière's statistics, the mortality before the fifth year is 54 per cent and the mortality before the twentieth year is 89 per cent.

Hæmophilic hæmarthrosis of the knee is not spontaneous, but follows a mild trauma. The knee joint rapidly distends. It is warm, but shows no changes in color. There is a slight fever. If the child suffers from the familial type of hæmophilia, other hæmorrhages have probably occurred beneath the skin or mucous membranes. The hæmarthrosis must never be drained or touched in any way as even a puncture of the joint is dangerous. The joint should be immobilized in a splint for at least ten days and the patient kept at absolute rest. A transfusion of human blood or fresh animal serum may cause the swelling to disappear in a few days and the joint to regain its normal motion quickly.

When once disturbed, the synovia becomes fragile, the synovial fluid undergoes changes, and fibrous adhesions form with thickening of the joint which limits movement. The blood supply of the epiphyses may be endangered. The lesion may be limited by regular monthly injections of 10 c.cm. of antidiphtheritic serum. Early roentgen-ray findings are a widening of the intercondyloid space and transverse striæ in the bones. The joints are enlarged and feel doughy. The range of motion is limited, and the muscles become atrophied. The knee should be immobilized and subcutaneous injections of antidiphtheritic serum or blood transfusions should be given monthly.

Deforming arthritis results in changes of the bony surfaces. The normal areas of apposition are lost, backward subluxation of the tibia ensues, and new bone formation with local absorption becomes apparent. The treatment consists in correcting deformities. One hour before the attempt is made, from 100 to 200 c.cm. of human blood should be given intravenously. The correction should be done under general anesthesia. Breaking up of the adhesions by gentle flexion should be followed by full extension and the application of a plaster gutter splint. Weight-bearing must be forbidden for a long time.

The article contains roentgenograms made in typical cases.

KELLOGG SPEED, M.D.

Moulouquet: Clinical Examples of Arthritis Deformans of Traumatic Origin (Exemples cliniques d'arthritides déformantes d'origine traumatique). *Bull. et mém. Soc. nat. de chir.*, 1931, lvii, 817.

The author believes that arthritis deformans is usually of traumatic origin. This theory is supported by the discovery in the walls of the affected joints of small bone fragments torn from the bone ends and by the fact that bone dust, pieces of cartilage, or horse serum introduced into joints experimentally act as nuclei for the formation of material about them with subsequent arthritic changes.

As clinical evidence in support of his theory Moulouquet cites cases of deforming arthritis developing in the elbows of men who work with pneumatic drilling machines and cases in which arthritis occurs sometimes years after fractures into joints. The arthritis in cases of the latter type he attributes to pulverization of the bones.

One of the cases cited was that of a tabetic man who fractured the upper third of his leg. The knee showed no change. Three years later the patient had a typical Charcot joint. The author attributes the Charcot joint to aggravation of the osseous arthritic anesthesia by motor incoordination and traumatic insults.

In conclusion, Moulouquet says that in cases of fracture greater care must be taken to restore the normal axial relationship of adjacent joints in order to prevent continued trauma on the joints after the fracture has healed.

KELLOGG SPEED, M.D.

Razemon and Bizard: Primary Tumors of the Joints (*Les tumeurs primitives des articulations*). *Rev. de chir.*, Par., 1931, I, 229.

This article is based on seventy-five cases of primary tumors of joints including seventy-four cases collected from the literature and one case treated by the authors. A primary tumor of a joint is defined as a neoplasm in the depths of the synovia or arising from the juxta-synovial area which, in developing, spreads into the interior of the joint.

Benign primary tumors of joints are lipomata, fibromata, angiomata, and giant-cell tumors. Malignant tumors are the mixed-cell, the spindle-cell, and the myxosarcomata and a rare tumor called by some a synovial endothelioma.

Of the seventy-four primary tumors of the joints collected by the authors from the literature, sixty-three were in the knee, eight were in the ankle, and one was in the elbow. The site of two was not stated. Forty-five were benign. The authors discuss these tumors in detail from the standpoints of morbid anatomy, clinical findings, and treatment.

The clinical study of these tumors is difficult and unsatisfactory because they have few characteristic symptoms and often develop as a result of trauma or chronic arthritis. The neoplasms are of four

main types: (1) mobile tumors, suggesting joint mice, (2) localized fixed tumors, (3) diffuse tumors, resembling the white swellings of tuberculosis, and (4) ulcerating tumors, a rare form which is always malignant.

Angiomata grow very slowly and often have their origin in some trauma in infancy. They are benefited by immobilization, but re-appear on the resumption of walking or after fatigue or trauma. They are always painful.

In the diagnosis and treatment of primary tumors of joints arthrotomy is required. If the tumor is benign it may be excised locally, but if it is malignant the limb must be amputated. Local excision may require complete synovectomy or resection of the joint.

In the authors' case there was a limited fusiform sarcoma of the synovia of the knee. After local excision the patient was still free from recurrence at the end of two years.

KELLOGG SPEED, M.D.

Holloway, L. W.: Caput Obstipum Congenitum. *South. M. J.*, 1931, xxiv, 597.

Holloway reviews the various theories regarding the cause of caput obstipum congenitum. The relationship of this tumefaction to congenital torticollis has not been determined. The author discusses birth trauma, infection, and circulatory changes produced by malposition in the uterus as factors in the etiology. He reports eleven cases. In the case of an infant delivered by caesarean section the sternocleidomastoid tumor was noted on the twelfth day. The pathological findings in the five cases which were operated upon showed uniform replacement of the muscular substance by fibrous tissue. No blood pigment was demonstrated in any of the sections.

The author concludes that caput obstipum congenitum in the sternocleidomastoid muscle is a clinical entity and not a hematoma, and that the tumor mass is usually followed by torticollis. He advises early excision.

PAUL C. COLONNA, M.D.

Shore, B. R.: Congenital Elevation of the Scapula. *Surg. Clin. North Am.*, 1931, ii, 667.

Shore reports a case of congenital elevation of the scapula (Sprengel's deformity) which was treated by resection of the upper margin of the scapula and an anomalous bone which articulated with the superior vertebral border of the scapula and the sixth cervical vertebra. This operation increased the range of active and passive motions, especially elevation of the arm. Shore states that the accessory bone found in this case is present in a large percentage of the cases.

ELVEN J. BERKHEISER, M.D.

Harmon, P. H., and McKenna, H.: Primary Myelogenous Sarcoma Complicating Cystic Disease of the Humerus: Report of a Case. *Arch. Surg.*, 1931, xlii, 903.

It is generally believed that cystic disease of bone rarely or never undergoes malignant change into

primary sarcoma of bone. In the literature the authors found only one case in which such a change was thought to have occurred, a case reported by Helling.

In this article, Harmon and McKenna report a case of cystic disease of the humerus in which positive evidence of bony periosteal lippling and the presence of a significant although small amount of stroma that could have been produced by potential osteoblasts led to a diagnosis of osteolytic myelogenous sarcoma complicating the cystic disease. The patient was a woman sixty-five years of age, and the tumor occurred in the distal metaphysis of the humerus. Osteolytic myelogenous sarcoma is rare at that age and in that location. The majority of the microscopic fields of sections of the tumor presented a picture not unlike that found in myeloma, thus demonstrating how deceptive an incomplete histological study of malignant tumors of bone may be.

H. EARLE CONWELL, M.D.

Rocher: Acetabular Coxalgia. Seven Cases (A propos de la coxalgie cotyloïdienne. Sept observations). *Bordeaux chir.*, 1931, No. 2, 101.

The seven cases of coxalgia reported were seen during a period of three years. Six of the patients were boys. The ages ranged from four to fourteen years. Six of the patients were seen while the condition was still in the stage of osteitis of the acetabulum, but one came for treatment with a large abscess and dislocation of the hip. In five cases the condition was found to be due to tuberculosis. One of the patients died.

Acetabular osteitis starts insidiously as a reaction in the hip joint accompanied by slight pain, peri-articular shrinkage, and limitation of motion, chiefly abduction. The catch or hitch is positive at an early stage, but soon becomes negative after a period of immobilization. A slight hypotonia is present in the muscles at the upper end of the thigh. There is no adenopathy. The duration of the joint reaction varies from a few weeks to several months, and is followed by invasion of the joint which lifts off the cartilage lining the acetabular cavity and often progresses along the sides of the acetabulum and ends in pathological dislocation.

The onset may be very acute with fever, abscess formation, and severe pain. Repeated roentgen-ray examinations are required to confirm the diagnosis. At first there are no positive roentgen-ray findings. Later, the roentgenogram shows distention of the joint or a small necrotic area in the bone surrounded by a dense calcified area, the so-called "leopard spots." Neighboring periostitis may be evidenced by a thin area of newly formed bone along the inner side of the acetabulum and adjacent areas. A pathological central dislocation of the head of the femur may occur. The head and upper end of the femur may remain intact for a long time although they become somewhat decalcified.

Some of the lesions of this type first appear low down behind the head of the femur and early lead

to loosening of the conjugal cartilage and dislocation of the hip. There is difficulty in differentiating the condition from tuberculosis of the hip. In one of the cases reported by the author the lesion was considered to be an arrested encysted tuberculous inflammation of the ilium.

The prognosis for the future use of the joint can often be judged from the roentgenogram; also the type of treatment indicated—whether direct surgical attack, rest with the leg in traction, or immobilization in plaster.

For the surgical treatment of lesions on the edge of the acetabulum the author favors the Smith-Petersen incision. For deeper or internal abscesses or infection he describes an approach which he has worked out on the cadaver, but as yet has not used in practice. With the leg held in extreme abduction, an entrance is made on the inner side of the femoral vessels, Poupart's ligament is severed, and the abdominal muscles and peritoneum are reflected down toward the acetabulum on the inner surface of the pelvic wall.

KELLOGG SPEED, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

McNealy, R. W., and Lichtenstein, M. E.: Muscular Relaxation Produced by Novocain as an Aid in Tendon Repair. *Surg., Gynec. & Obst.*, 1931, liii, 40.

The authors report on the intramuscular injection of novocain for the production of muscular relaxation. This has been found a desirable procedure in the suturing of tendons. The muscular relaxation obtained is such that the tendon sheath need not be opened or probed to bring down the retracted tendon and the relief of tension on the suture line for a short preliminary period aids union of the severed tendon.

Severance of a tendon is followed by immediate contracture of the proximal end of the tendon due to nerve impulses reaching the muscle from the central nervous system. This is known as the "primary hypertonic contracture" and when not relieved passes into a secondary state known as "myostatic contracture" which is due to changes in the muscle fibrils. A muscle in myostatic contracture is shorter and less extensible than normal muscle. As novocain prevents the reception of motor nerve impulses to the muscle, its intramuscular injection, when repeated sufficiently often, may also prevent the development of secondary contracture.

In a muscle-nerve preparation from the frog the intramuscular injection of 1 per cent novocain caused failure of muscle response to nerve stimulation within a period of five minutes. In the unanesthetized dog, the duration of the relaxation produced by a single injection of 1 per cent novocain lasts for from thirty minutes to four hours. The variation in the duration of the relaxation is due to differences in the activity of the limbs. When the

extremity is at rest and its requirement of blood is therefore minimal, the action of the novocain is prolonged. Adrenalin does not appear to prolong the duration of the effect of novocain. Injections of from 5 to 10 c.cm. of novocain into the extensor muscles of the paw of a dog, repeated twice daily for a period of four to five days, definitely diminished the retraction of the severed tendon.

Pasman, R. E.: The Present Status of the Surgical Treatment of Pott's Disease in the Adult (Estado actual del tratamiento quirúrgico del mal de Pott del adulto). *Congreso argent. de cirug.*, Buenos Aires, 1930, p. 765.

Pasman reviews 556 cases of Pott's disease. He regards spinal fusion alone as merely an aid in the treatment of the condition. The most important contra-indications to surgery are the presence of active suppuration in the region of the spine and a poor general condition. Spinal fixation has always given good results regardless of the technique used. As a rule it is done under local anaesthesia. The author emphasizes the importance of both pre-operative and postoperative immobilization of the spine. He states that the postoperative period of immobilization varies with the case, but averages about six months. For patients who refuse to remain in bed for a specified time, he recommends a special type of corset.

In conclusion, Pasman says that the rational treatment of Pott's disease, whatever its location and whatever the age of the patient, should consist in the corrective orthopedics necessary and rest on a hard bed.

FRANCIS M. CONWAY, M.D.

Egafia, A. R.: The Present Status of the Surgical Treatment of Pott's Disease in the Child (Estado actual del tratamiento quirúrgico del mal de Pott en el niño). *Congreso argent. de cirug.*, Buenos Aires, 1930, p. 665.

Egafia states that in his opinion the present-day treatment of Pott's disease by spinal fusion is incapable of supplanting the classical orthopedic treatment. Spinal fusion should be considered only an adjuvant to orthopedic treatment. By itself, it is incapable of curing the tuberculous focus. Its only purpose is to accelerate the cicatricial repair process indirectly by immobilizing the spine. In the cases of children it should not be used indiscriminately. It gives the best results when the tuberculous focus is in the dorsolumbar or lumbar region and the lesions have a tendency to become quiescent. When the focus is in the cervical or cervicothoracic regions, it gives good results only exceptionally. It is absolutely contra-indicated in cases with abscess, fistula, or paraplegia.

FRANCIS M. CONWAY, M.D.

Girdlestone, G. R.: The Operative Treatment of Pott's Paraplegia. *Brit. J. Surg.*, 1931, xix, 121.

On the basis of twelve cases which he reports in detail, the author recommends simultaneous laminectomy and bone grafting for tuberculosis of the

spine in adults when paraplegia is present. Laminectomy is indicated either because the paraplegia will not clear up without operation or because long compression is harmful to the cord. If the roentgenogram shows a nearly spherical prevertebral abscess, a costotransversectomy may be performed two weeks before the combined operation. Laminectomy alone further weakens the diseased spine, but laminectomy combined with the introduction of a twin bone graft strengthens it.

For the operation performed by the author the patient is laid on a moulded anterior plaster-of-Paris case. A curved incision is made to the left side to facilitate the use of the motor saw. The incision is continued exactly to the apex of the spinous processes and through the interspinous ligaments for three spines of the laminectomy area, two above and two below. With a motor saw, flakes of bone are cut from each side of the spines and completely separated with an osteotome. The laminectomy is performed without opening the dura. Two grafts about $\frac{3}{8}$ in. thick are then cut from the tibia and laid on either side of the remainder of the spines above and below so that they bridge the laminectomy defect. The grafts are anchored and the lateral flakes of bone are approximated to them but suturing the supraspinous ligaments over them. After the operation the patient remains on a frame or plaster bed for three or four months.

WALTER P. BLOUNT, M.D.

Crego, C. H., and Fischer, F. J.: Transplantation of the Biceps Femoris for the Relief of Quadriceps Femoris Paralysis in Residual Poliomyelitis. *J. Bone & Joint Surg.*, 1931, xiii, 515.

The authors report sixty-three cases of forward transplantation of the biceps femoris to replace or re-inforce the quadriceps femoris. Their conclusions are as follows:

1. The operation should not be done in the presence of deformity of the knee or hip, in the absence of sufficient posterior support of the knee, or unless there is reasonable hope that mechanical support can be discarded.

2. Essentials of a well-executed operation are: (a) preparation of an adequate patellar bed for the tendon, (b) sufficient freeing of the biceps femoris muscle upward to insure the maximum obliquity of pull, and (c) firm suturing of the tendon to its new insertion under tension and with the knee and hip in full extension.

3. The stage of muscle re-education determines to a great degree the success or failure of the transplantation. Important factors are: (a) the early institution (in the third or fourth week) of exercise, baking, and massage, (b) mechanical support of the transplant for at least a year, (c) daily exercise directed at both extension and flexion of the knee continued over a period of at least twelve months.

4. Complications and failures are usually avoidable if the cases are properly selected and the treatment is properly carried out.

H. EARLE CONWELL, M.D.

FRACTURES AND DISLOCATIONS

Voncken, Demonic, and Ory: Six Cases of Enucleation of the Semilunar Bone (Six cas d'enucleation du semilunaire). *Arch. méd. belges*, 1931, lxxiv, 221.

The most important carpal lesions are fractures of the scaphoid, retrolunar dislocation of the carpus, and Kienboch's disease of the semilunar bone following trauma. Of these, the most important is the retrolunar dislocation which is caused by a fall or a blow on the hyperextended hand. Fifty per cent of dislocations of this type are accompanied by fracture of the scaphoid. When the posterior radiolunar ligament is torn and the anterior ligament remains intact, the latter acts as a hinge to swing or enucleate the semilunar bone out of place. If all of the ligamentous attachments are ruptured the semilunar bone is squeezed out into the soft parts.

Dislocation of the semilunar bone is usually followed by immediate severe pain, marked loss of the function of the hand, and a forked deformity below the end of the radius. Pronation and supination of the wrist may be normal, but the flexion and extension are greatly limited and painful and the fingers are held in half flexion. The median or ulnar nerve may be subjected to pressure.

Traumatic lesions of the semilunar bone are severe. When uncared for, they have an unfavorable prognosis. Even when they become well healed, the prognosis must be reserved as complications, chiefly from nerve pressure, may develop. An associated fracture of the scaphoid aggravates the condition. The cure of these lesions is slow. Restoration to normal is not the rule.

The treatment of dislocation of the semilunar bone is immediate reduction under general anesthesia. Reduction is generally possible in the first fifteen days after the accident, but is impossible after a month. In making closed reduction by traction on the hand with hyperextension to open up the radiocarpal space and pressure on the semilunar bone, care must be taken not to injure the median nerve. In cases of old dislocations it is necessary to be satisfied with partial restoration of function or to remove the semilunar bone with the fragment of scaphoid bone attached to it if the latter is fractured. An approach through a palmar incision to avoid the median nerve is best. Carpal resection should be reserved for old cases with ankylosis.

In the first of the six cases reported by the author, physical therapy resulted in fair function five months after the accident.

In the second case, the semilunar bone was reduced early by operation and movement was begun after seven days. Five months later the patient was able to work, but crepitus was noted in the joint and traumatic arthritis was present.

In the third case, the dislocation of the semilunar bone was complicated by a fracture of the scaphoid.

Immediate removal of the bone fragments by operation resulted in cure.

In the fourth case, a simple dislocation of the semilunar bone was reduced within forty-eight hours. Three months later the movements of the wrist were normal, but crepitus was noted on palpation.

In the fifth case, complete reduction was impossible by manipulation, but operation was not performed. Two months later no evidence of disease was apparent in the semilunar bone, but there was muscular atrophy of the forearm with swelling on the back of the wrist, cyanosis, thickening of the carpus, and weakness of the grip.

In the sixth case, bone fragments were removed by open operation after two unsuccessful attempts at reduction. The result was poor.

KELLOGG SPEED, M.D.

MacKinnon, A. P.: Fractures and Dislocations of the Spine. *Canadian M. Ass. J.*, 1931, xiv, 35.

MacKinnon reviews fifty cases of fractures and dislocations of the spine. The principles of treatment were those followed in the treatment of fractures in general—manipulation to restore alignment and fixation. The author emphasizes the importance of restoring the lumbar curve. He restores this curve by the Galloway method. He advocates fusion for spinal fractures only in late cases. He rarely performs a laminectomy as he believes that direct bony pressure on the intraspinal structures is rare except in cases in which these structures are destroyed.

The article is summarized as follows:

1. Fractures and dislocations of the spine are common enough to be of interest to the general practitioner.
2. Fracture of the spine may be caused by trauma so slight that it may not be suspected, but the mechanism in the various parts of the spine is well understood.
3. Lateral roentgenograms of the region believed to be involved are of importance in the diagnosis.
4. A method of treatment is outlined which, in its simplicity and effectiveness, is comparable to the treatment accepted for Colles' fracture at the wrist.
5. Spinal fusion is not often indicated in early cases, but is of great value in late neglected cases.
6. As pressure of bone on the cord is rarely, if ever, responsible for persistence of the disability, laminectomy is very seldom indicated.

FREDERICK A. JOSTES, M.D.

Bartley, S. P.: The Treatment of Fractures of the Body of the Os Calcis; Demonstration of Technique (Open and Closed); Demonstration of End-Results. *Surg. Clin. North Am.*, 1931, ii, 637.

Comminuted fractures of the body of the os calcis without displacement of the fragments and without involvement of the subastragloid joint require no reduction or manipulation. In the author's treatment, the foot is immobilized in the normal weight-

bearing position in a plaster cast for from seven to ten days, at the end of which time the top half of the cast is removed for physical therapy. After from four to five weeks the plaster cast is removed. After eight weeks, weight bearing is permitted in a straight-last shoe with a long, wide heel.

In comminuted fractures of the body of the os calcis with displacement of the fragments, but without involvement of the subastragaloid joint, reduction is necessary for a satisfactory result. From five to seven days after the injury, the author manipulates the foot under anaesthesia to break up any adhesions that might have formed and to loosen any bone fragments that have become impacted. He then lengthens the tendon of Achilles, places the foot on its medial side on a well-padded block, and, with a mallet and the handle of another mallet, produces a lateral impaction. After the reduction, the treatment is the same as that of the first type of fracture discussed, except that a Whitman arch plate is sometimes used.

In comminuted fractures of the body of the os calcis with displacement of the fragments and involvement of the subastragaloid joint, Bartley performs a subastragaloid arthrodesis from seven to ten days after the injury. The subsequent treatment is the same as in the other types of fractures except that one week after the operation the cast and sutures are removed, the position of the foot is inspected, and a new cast is applied. In this type of fracture the period of disability is somewhat longer than in the other types.

ELVEN J. BERKHEISER, M.D.

ORTHOPEDICS IN GENERAL

Schanz, A.: Disease and Pathological Anatomy (Krankheit und pathologische Anatomie). *Ztschr. f. orthop. Chir.*, 1931, liii, 433.

To the question, "What is disease?", the answer usually given is that disease has as its foundation the presence of anatomicopathological changes. In the encyclopedia of Eulenberg, Samuel says: "All disturbances in the physiological activity of the organism are called diseases." Also in all other definitions it is stated that disease is a physiological disturbance of physiology. Disease is not a function of anatomy, but a function of life. With death, disease stops. At autopsies, the anatomist can demonstrate no diseases, but only the cause and effects of diseases, the products of organic protection and healing processes and the variations in somatic anabolism. Every disease exerts an effect on the body. Deviations from the normal are not prerequisites to disturbance of the normal processes of life. Pathological findings do not necessarily produce signs of disease. There are diseases without pathological findings, such, for example, as hysteria, neurasthenia, neuroses, nervous or functional organic diseases, nervous digestive disorders, and neuroses of the heart. In fact, the occurrence of functional disturbances without anatomical changes

is characteristic of these conditions. When no anatomical changes are demonstrable, the diagnostician assumes the presence of a neurosis much more frequently than the patient.

A striking example of disease with pathologico-anatomical change is fracture of the femur, the symptoms of which are based upon an anatomical lesion. A cure of this condition means restoration of the normal anatomy. If limping results from shortening due to the fracture, there is a disturbance of the normal function, namely, a disease produced by an anatomical change. If a deformity such as genu valgum becomes manifest after the fracture, we have a disease with a direct anatomical cause. The abnormal posture of the knee is responsible for a functional injury of the knee. A physiological factor is added to the anatomical factor. When the reserve strength of the knee is exhausted by increased usage, arthritis deformans ultimately develops. In this disease, developed as the result of function and induced by physiological disturbances, there again occur anatomical changes, the erosions of the articular surfaces characteristic of arthritis deformans. The most important factor is function. This of far greater importance than the form or the anatomy. A change in the anatomy produces disease only through a disturbance of function. It is the duty of the physician to eliminate this disturbance of function even if he cannot restore the normal anatomy. When necessary, a new anatomical change may be attempted for the restoration of function. In this way, a cure or at least a diminution of the signs of disease is often obtained. As an example, the author cites congenital dislocation of the hip.

Often the living organism itself produces a change in the anatomy for therapeutic purposes, as in spondylitis deformans. This condition represents an adjunct construction for the support of the vertebral column. It is not a true disease, but a product of protection against disease. However, because of the resulting loss of mobility of the spine, it may become a cause of disease.

The author considers arthritis deformans a disease of usage; therefore, not an anatomical, but a physiological disease. The arthritic pains are not the result of anatomical changes, but the evidence of the disturbance of functional balance. The marginal eminences vary just as much as the pains; in especially severe cases they are entirely absent.

The author thinks that in disease processes with a rapid course the body has no time to undertake suitable anatomical changes or takes no protective measures that will be useless from the start.

Diseases sometimes, but not always, result also in anatomical changes of the body. Anatomical variations such as spina bifida occulta and sacralization of the fifth lumbar vertebra are variations from the normal which may not result in disturbance of function. To the degree to which they vary from the normal, the author considers them "relatively pathological." These variations, in themselves

insignificant, are often erroneously considered causes of symptoms in which they have no part and are designated as diseases. In insufficiency of the vertebræ they are found frequently in the lower portions of the spinal column. They are erroneously considered the cause of symptoms which, in reality, are symptoms of insufficiency. The anatomical change, as such, produces the syndrome of insufficiency only when the balance of weight-bearing is disturbed. The physiological effects of the insufficiency may have disappeared, but the anatomically produced deformity of weight-bearing remains. It acquires significance only when it produces functional disturbances. Then this former result of disease becomes a cause of disease.

The author summarizes briefly the numerous relationships between disease and pathological anatomy as follows:

Disease is not identical with pathological anatomy, and pathological anatomy is not identical with disease. There are diseases without pathological anatomy. Pathological anatomy may also be a cause of disease. Pathological anatomy, the result of disease, may again become a cause of disease.

Variations of the anatomy which produce no disturbances of function should not be considered pathological in the true sense of the word. They should be considered relatively pathological when the disease-producing influences increase the possibility of attack by disease.

Schanz emphasizes that young physicians should be intimately acquainted with the definition of the term "disease." The conception of disease as a disturbance of life is an indicator for diagnosis and treatment of pathological anatomy. Even today, the science of pathological anatomy is chiefly a collecting and systematizing science. Only when it has completed its progress toward biological science will it reach its deserved importance. Disease is no pathological anatomy, but pathological physiology. The establishment of physiological pictures of disease is a demand of our time. The transition from the anatomical to the physiological standpoint is characteristic of medicine today. The purposeful advance of this transition is the path by which, to quote Sauerbruch, "we will emerge from the blind alley into which pathological anatomy has led us."

ENGEL (Z).

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Leriche, R., and Jung, A.: Experimental Studies of Surgical Oedema of the Extremities of Phlebitic Origin (Recherches expérimentales sur les œdèmes chirurgicaux des membres d'origine phlébitique). *J. de chir.*, 1931, xxxvii, 481.

The venous system is unable to fulfill its physiological function without patency of its lumen and integrity of its walls. In the development of various circulatory disturbances, of which oedema is the most frequent, alteration of the vein wall is the more important factor. Leriche has contended for a number of years that phlebitic oedema is not a simple phenomenon of stasis, but primarily the result of changes in the parietal nerves and consequent vasomotor disturbances. This is proved by the disappearance of oedema after the resection of a venous cord obliterated by phlebitis in which no local hydraulic change was produced.

In this article three groups of experiments carried out on dogs are reported. In the first group, extensive segments of the principal veins of the posterior extremities were resected in several stages. The resection was followed by mild to moderate oedema which lasted for from two to eight days. At the end of that time complete recovery resulted. In the second series of experiments, sclerosing solutions of sodium salicylate were injected into isolated segments of the veins. This treatment caused oedema which usually lasted for from eight to twenty-two days and was followed by complete recovery. In the third group of experiments, the sodium salicylate solutions were injected into the adventitia of the veins without ligation of the vessels. Oedema developed somewhat later than in the other experiments and persisted for from one to eleven days.

In the second group of experiments, histological examination of the injected veins revealed an obliterating endophlebitis which had transformed the vessel into a sclerous block. The adventitia and perivascular tissues were involved in the inflammatory reaction, the elastic layer was atrophic, and the lumen was replaced by a mass of connective tissue penetrated by newly formed vessels. In the third group of experiments, in which the injection was made into the adventitia, the veins presented an intense periphlebitis with an obliterating endophlebitis. The traces of lumen did not represent newly formed vessels, but were the remnants of the original veins. In other respects, the results in the two groups were the same. The adventitia of the adjacent artery was involved in the periphlebitic reaction.

The authors attribute the oedema to the changes in the vessel walls. They found nothing to suggest a lymphatic origin. **LEO M. ZIMMERMAN, M.D.**

Zschau, H.: Investigations on the Problem of Thrombosis (Untersuchungen zur Thrombosefrage). *Deutsche Ztschr. f. Chir.*, 1931, ccxxx, 13.

Spontaneous venous thrombosis always has a number of causes. In addition to constitutional and external causes there are internal causes such as changes in the composition of the blood, the blood flow, and the venous walls.

In experiments on rabbits the author investigated the changes in the blood and endothelium occurring under the influence of parenterally administered foreign protein and the aseptic disintegration of autogenous cells.

In one group of experiments the rabbits were treated for from nine to ten weeks with intramuscular injections of caseosan, and from nine to fifteen days after the last injection a careful displacement of the femoral vessels was done. From three to eight hours after the operation the animals were killed. Repeated examinations of the blood during the period of caseosan injections revealed an increase in the total serum protein and the serum globulin, and a transitory increase in the thrombocytes and the viscosity. Morphologically, a definite endothelial reaction was seen in the displaced femoral vein after the operative procedure. In two cases there was the beginning of a white thrombus. In one case, deposition of fibrin had occurred in the stagnating blood of a displaced vein. The liver frequently showed moderate fatty changes, and in two cases a definite cirrhosis. These liver changes, like the endothelial reactions in the displaced veins, were attributed to the influence of decomposition products.

In another group of experiments, a piece of lumbar muscle was excised and again implanted, the expectation being that the tissue so handled would decompose. Fourteen days later the femoral vessels were displaced. After these procedures there was a definite, though less marked, increase in the total protein content of the blood. The serum globulin, the viscosity, and the thrombocyte count also increased. The morphological changes in the endothelium of the displaced veins were nevertheless somewhat less marked than in the first group of experiments.

On the basis of these findings the author comes to the conclusion that the causes of spontaneous thrombosis lie chiefly in blood changes. In agreement with Heusser and von Seemen, he believes that the postoperative blood change of greatest importance is the increase in protein substances which have an agglutinating effect on the platelets. The changes in the endothelium are brought about secondarily by decomposition products resulting from aseptic disintegration of tissue or the parenteral administration of protein. The author regards the slowing of

the blood stream as only a secondary or supporting cause of thrombosis.

The fight against, and the prevention of, postoperative thrombosis must consist in:

1. Limitation of cellular decomposition by careful handling of the tissues during operation.
 2. The reduction of postoperative absorption from wounds by the prevention of hæmatoma formation and necrosis.
 3. The influencing of postoperative blood changes by the subcutaneous administration of large quantities of normal saline solution (von Seemen) supplemented by the careful administration of thyroxin to increase the metabolism. In the cases of patients of the constitutionally embolic type, germanin may be administered to decrease the coagulability of the blood by diminishing the fibrinogen.
 4. Treatment of circulatory depression.
 5. Reduction of pathological postoperative intestinal absorption.
 6. Avoidance of the use of substances injurious to the endothelium.
- All questions arising from the study of experimental thrombosis and from metabolic studies on man are discussed in detail. HELLNER (Z).

Dietrich, A.: The Nature and Causes of Thrombosis and Embolism (Wesen und Bedingungen der Thrombose und Embolie). *Klin. Wchnschr.*, 1931, I, 54.

Dietrich reviews the pathologico-anatomical studies regarding the frequency of thrombosis which have been made in the past few years. He states that in the comparison of statistics it is necessary to consider hospital conditions, changes in the policy of hospitalization in general, and the ages of the patients. Figures obtained by him at Cologne and later at Tuebingen indicate that the incidence of thrombosis is higher in Tuebingen than in Cologne, but that the incidence of pulmonary embolism, especially fatal cases, is higher in Cologne than in Tuebingen.

In the development of thrombosis, three factors are noteworthy. (1) a hindrance to the blood current, the conditions of which have been worked out by Aschoff and his collaborators; (2) alterations in the blood itself, the significance of which is not entirely clear; and (3) alterations in the vascular walls, the demonstration of which is not easy since they are quite transitory and not uniformly pronounced in all portions of the vessels. In affections of a septic character there has been demonstrated in the endothelium of the veins an increase in cells and an increase in number and clumping of the nuclei. Besides such localized changes in the vascular walls with small homogeneous thrombi, some of the cases studied by the author presented progressing thrombi.

The location, form, and prognosis of the thrombus are determined by the concerted action of the vessel walls, the blood, and the blood current. The great majority of thrombi are germ-free, but infections in the region supplied by the affected vein or general

infectious influences play an important rôle. The part played by decubitus, the importance of which in the causation of thrombosis of the femoral vein has as yet received little attention, is to be classed with the infectious-toxic influences. The danger of embolism is slight in cases of localized thrombosis of limited extent, but is great in cases of progressive thrombosis, especially when a sudden change in the condition of the vascular walls and in the blood leads to a rapid deposit of loose coagula. Nearly half of the cases of thrombosis with extensive and progressing coagulation terminate in pulmonary embolism (Cologne, 57.1 per cent; Tuebingen, 46.6 per cent). In Cologne the mortality of pulmonary embolism was 40.7 per cent, whereas in Tuebingen it was only 23.3 per cent. General experience shows that a blocking of two-thirds of the pulmonary vessels is to be regarded as fatal. It is not always easy to determine from the findings if death in cases of pulmonary embolism is a pulmonary death, a cardiac death, or a cerebral death due to oxygen-deprivation of the vital centers. Embolus as the cause of death often escapes clinical recognition as even the thrombotic process very frequently remains unrecognized. BERGEMANN (Z).

BLOOD; TRANSFUSION

Clément, F. M. L.: Hæmophilia Treated with Bird's Muscle (Hémophilie et muscle d'oiseau). *Bull. et mém. Soc. d. chirurgiens d. Par.*, 1931, LXVII, 305.

The author reports the case of a boy nine years old who was a hæmophilic and had a persistent hæmorrhage for sixteen days after the extraction of a canine and a premolar tooth. Ordinary medical remedies such as antidiphtheria serum, hydrogen peroxide, paternal blood, and small blood transfusions, failed to check the bleeding. The author finally thought of Martel's use of bird muscle as a hæmostatic agent. He therefore excised 1 cm. of the pectoral muscle of a rooster and applied it to the bleeding alveolus. The hæmorrhage ceased immediately.

Clement briefly reviews the well-known facts regarding hæmophilia. The condition seems to be characterized by a lack of thrombokinase in the blood. Most of the ordinary blood-coagulating remedies seem insufficient in hæmophilia. Reference is made to the work of Martel who used muscle from the pigeon as a hæmostatic agent in neurological surgery. For the occurrence of coagulation, thrombin must act on fibrinogen. Thrombin is formed in the presence of calcium salts by two other elements, cytozyme and serozyyme. In mammals, serozyyme is contained in the plasma and cytozyme in the blood corpuscles. In birds, the tissues, particularly the muscles, contain both cytozyme and serozyyme and the plasma contains only fibrinogen. These elements are free to act only when the muscle is injured. Bird muscle is therefore a storehouse of the elements required for coagulation. The blood

of birds remains liquid until it comes into contact with injured tissues.

The muscle of any bird may be used for hæmorrhage. It must be removed under aseptic conditions.

In the discussion of this report, MASSART stated that in the local treatment of hæmophilia the clot should be removed before a therapeutic agent is applied as otherwise the bleeding may continue indefinitely under the clot. JACOB E. KLEIN, M.D.

Bürkle-de la Camp: Blood Transfusion in Generalized Infection (Bluttransfusion bei Allgemeininfektion). *Zentralbl. f. Chir.*, 1931, p. 347.

Blood transfusion may be life saving in generalized infection. Its action is double. It restores destroyed blood elements, particularly the hæmoglobin, and it acts as a stimulus to greater cellular activity of the blood-forming tissues by means of the salts and foreign but compatible proteins in the transfused

blood. Until this stimulation occurs, the transfused blood can tide the seriously ill patient over the danger period. Several small transfusions are preferable to a single transfusion of a large amount of blood.

Surgical treatment of the source of the generalized infection and of the purulent metastases is always necessary as blood transfusion has no direct effect upon encapsulated foci or progressing phlegmonous processes.

The author gives the transfusion with a tube made of athrombit. The blood is always taken from the donor percutaneously and is given to the recipient percutaneously when possible. The needles used are made of ainit, a rustless steel which is smoothly polished within and has little tendency to cause coagulation. The addition of sodium citrate or similar anticoagulant to the blood is unnecessary.

L. LURZ (Z).

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Brown, A. L.: Postoperative Pulmonary Atelectasis: Observations on the Importance of Different Types of Bronchial Secretion and Anæsthesia. *Arch. Surg.*, 1931, xxi, 976.

Brown emphasizes the importance of the bronchial secretions in the production of postoperative atelectasis and the determination of the type of the latter condition. Thick, tenacious sputum plugs the larger bronchi, whereas thinner sputum tends to be more widely dispersed and to block the fine bronchi and bronchioles, thereby producing a scattered lobular atelectasis.

The impression is gained that spinal anæsthesia predisposes to postoperative atelectasis because it definitely inhibits the depth and force of the respiratory movements during and for a considerable period after the operation, it is followed by an increase in the viscosity of the secretions of the tracheobronchial tree, and it tends to cause the patient to remain relatively quiet for a number of hours.

JOHN J. MALONEY, M.D.

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Underhill, F. P., and Kapsinow, R.: The Alleged Toxin of Burned Skin. *J. Lab. & Clin. Med.*, 1931, xvi, 823.

The authors report experiments carried out on guinea pigs which seem to disprove the theory of Robertson and Boyd that burned skin contains a toxin. They attribute the symptoms noted by these investigators after the intraperitoneal injection of extracts of burned skin to the presence of a considerable quantity of alcohol in the extracts. In their own experiments the symptoms and effects produced in guinea pigs by injections of the blood of burned animals differed little from those noted after similar injections of normal blood.

It is suggested that the symptoms and effects of a burn may be adequately explained by concentration of the blood to a degree that is incompatible with life. The concentration of the blood is the result of the large loss of fluid from the blood to the wounded area. The authors discuss the therapy of burns from this viewpoint. CARL R. STEINKE, M.D.

Solovov, P.: Latent Infection in Tissues and Organs (Ueber die ruhende Infektion in Geweben und Organen). *Verhandl. d. 21. russ. Chir.-Kongr.*, Leningrad, 1929-1930.

By "latent infection" is meant the symptomless existence of bacteria in the human body. It may be

the result of the ordinary symbiosis of man with the various bacteria of the skin and mucous membranes, but often is the result of a definite disease. However, under favorable circumstances, any microorganism that lives as a parasite on or in the body may become pathogenic and is therefore to be considered potentially infectious. Nicolle and Zlatogorov call such bacteria "microbes de sortie."

As a typical example of latent residual infection, the author cites the presence of tubercle bacilli in the peribronchial and peritracheal lymph glands after a primary focus early in childhood. Cases of latent infection with exacerbation were recognized by Larrey, Billroth (1868), and Kraske (1886).

The defense on the part of the body consists of the mobilization of cells and humoral antibodies, and of connective tissue encapsulation of the infecting agents. Latent infection is most frequently localized in scars and adhesions following complicated wounds or septic or suppurative processes, and in regional lymphatic glands. They are rather frequent also in the reticulo-endothelial system (bone marrow, liver, and spleen), and the kidneys. Streptococci are especially important because of the inability of the human body to produce specific antibodies against them and because they are readily carried from the blood stream into distant organs and tissues. Rosenow has shown that the streptococci in oral sepsis may give rise to gastric ulcer, pyelitis, infectious poliomyelitis of childhood, renal stones, and other conditions. The author calls attention particularly to the presence of streptococci in the mesenterium of the appendix following sore throat. Fatalities following appendectomy shortly after throat infections have been reported by Jaure and Oppel. The author reports a case of his own. He states that a laparotomy, such as appendectomy, should never be performed immediately after an angina or anginoid throat infection, and that during the operation the stump of the mesenterium should always be painted with tincture of iodine.

It is not always easy to recognize the existence of a latent infection before operation. Determinations of the body temperature and of the temperature at the site of the suspected infection, a leucocyte count, a differential count of the blood cells, and the sedimentation reaction of the erythrocytes are of assistance. When a latent infection is suspected the injection of polyvalent staphylococcus and streptococcus vaccine with simultaneous mechanical stimulation (massage, passive gymnastics, tapping of the scars) and even biopsy of the suspicious scars as advised by Lexer is indicated. The appearance of a general or local reaction in the first case and of severe suppuration after discission of the scars are positive evidence of the existence of a serious latent infection.

Therapeutically and prophylactically, arterial hyperemia and measures to increase the local oxidation processes should be employed. For this purpose heat of all types, hot air, sunlight, artificial sunlight, local mud baths, and roentgenotherapy are of value.

In conclusion the author suggests that unexpected severe wound infections and fatalities after so-called aseptic operations performed with the greatest skill and the observation of all precautionary measures may be due to the exacerbation of an unrecognized and often undemonstrable latent infection. He emphasizes that in such cases it is impossible to hold the surgeon responsible for the wound infection or the fatality.

J. KORNMAN (Z).

Milch, H.: The Treatment of Gas Gangrene. *Ann. Surg.*, 1931, xciii, 1220.

The treatment of gas gangrene requires radical surgery and the liberal use of a polyvalent serum. The author reviews the methods previously used in this condition. All chemical agents tried have been found unsatisfactory.

If any suspicion of gas gangrene arises, a free incision should be made promptly through skin and muscle sheaths to relieve the tension, establish drainage, evacuate any gas that may be present, and admit air to the tissues. If the muscle shows swelling, lack of contractility, and the early brick-red or later greenish color which is characteristic of gas gangrene, it should be subjected to free *épluchage*—either excision through normally red and moist muscle that contracts actively under the knife or removal of the entire muscle or muscle groups. In the diffuse, rapidly spreading type of gas gangrene, prompt amputation, preferably circular and without suture of the stump, should be done well above the zone of infection. Gauze packing is dangerous as it excludes

air and causes a damming of the wound discharge, thus favoring spread of the infection. Amputation should be followed by the use of serum.

The author has obtained particularly good results with a polyvalent serum containing 4,000 units of tetanus antitoxin, 15,000 units of perfringens antitoxin, 35,000 M.L.D. of vibron antitoxin, and 20,000 M.L.D. of histolyticus antitoxin per 100 c.cm. of saline solution. A double dose is given immediately after the operation and a dose of 100 c.cm. after an interval of four hours. When the serum is administered early, smaller amounts will be required than when it is administered late. The amount to be given and the interval at which it should be given must be determined on the basis of the severity of the infection and the patient's response to the treatment.

Although the specificity of this polyvalent antiserum in the cure of definitive gas gangrene has not been completely established, there is no doubt that the antiserum reduces the mortality when it is used as a curative measure and reduces the morbidity when it is used prophylactically.

The prophylactic dose of polyvalent gas-gangrene antitoxin is now being prepared in conjunction with tetanus antitoxin for commercial sale. It contains 15 units of tetanus antitoxin, 10 units of perfringens antitoxin, and 10 units of vibron antitoxin, and is as easily administered as tetanus antitoxin alone.

In addition to the prophylactic use of sera, shock must be energetically combated and the tendency toward acidosis controlled by alkalization of both the local wound and the entire organism.

Local, spinal, or nitrous oxide anaesthesia should be used for operation as chloroform and ether tend to cause acidosis and therefore favor gas infection.

MANUEL E. LICHTENSTEIN, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Viviani, R.: The Effect of the X-Rays on the Secretion of Histamine by the Stomach in Normal and Gastropathic Subjects (Influenza di radiazioni X sulla secrezione gastrica da istamina in soggetti normali ed in gastropazienti). *Radiol. med.*, 1934, xviii, 723.

Viviani reviews the literature on the effect of the X-rays on gastric secretion and points out the uncertainties and contradictions in the results that have been reported. To a great extent this discordance is due to the great variety of techniques employed in the use of the X-rays and in the study of the function of the stomach.

In an attempt to obtain definite data on the chemistry of the stomach the author used histamine which he thinks is superior to the ordinary test meals as an indicator of secretory function.

The gastric secretion was examined in twelve cases after fasting, after the administration of histamine, and after X-ray treatment. The factors in the X-ray treatment were 200 kv., 2 ma., a 3-cm. target-skin distance, a 10 by 15 cm. field front and back over the stomach, filtration with $\frac{1}{2}$ mm. of zinc plus 4 mm. of aluminum, from 2,600 to 3,600 R. (Solomon), and from seven to nine sessions at intervals of two days.

On the basis of these investigations and many other studies made on normal persons and persons with gastric disorders, Viviani concludes that there is a definite though transitory inhibition of the secretory function of the stomach especially as regards acids and pepsin. Not all subjects responded to an equal degree, but there was no marked difference between normal subjects and subjects with stomach lesions. In one case the inhibition lasted six months. Viviani thinks this depression was due to a direct effect of the X-rays on the gastric mucosa. After reviewing the various factors which inhibit the physiological secretion of the stomach, he concludes that it is very important to consider the status of the gastric glands which the X-rays inhibit, and the nervous factors. Since in his study the patients with hyperchlorhydria showed a more marked effect than others, he believes his results put the X-ray treatment of conditions producing hyperacidity on a more firmly established basis.

EUGENE T. LEDDY, M.D.

Pfahler, G. E., and Parry, L. D.: The Treatment of Osteogenic Sarcoma by Means of Irradiation. *Am. J. Roentgenol.*, 1934, xxv, 761.

In their discussion of the treatment of osteogenic sarcoma by irradiation, Pfahler and Parry emphasize the importance of obtaining an accurate diagnosis and cite the difficulties encountered in the diagnosis.

According to the Registry of Bone Sarcoma, an accurate history, roentgenograms taken at different angles, and biopsy are required for diagnosis. Ewing and Kolodny believe that the history and roentgenograms are of chief importance. There is a difference of opinion as to the advisability of doing a biopsy before operation or irradiation. It is asserted that the nature of most malignant growths and often the type of the malignancy can be determined by the use of the roentgen ray.

Osteogenic sarcomata vary in radiosensitivity. Those of the round-cell type are the most sensitive. Periosteal sarcomata are less sensitive. The more slowly growing bone-producing tumors are the most resistant. Besides the authors, Holfelder, Evans, and Leucutia have cases under observation which show no recurrences after from one to ten years. The authors recommend a preliminary trial of irradiation before surgery in all cases of osteogenic sarcoma despite the slow response frequently noted at first. Frequently a response becomes apparent after three months of treatment. The saturation method of irradiation is used, moderate doses being increased to from 100 to 120 per cent of a tumor dose in a period of a week. The preliminary course is carried over a month. Great care is taken to protect the normal soft tissues and to make and record careful measurements of doses and their cumulative values.

The authors report a number of cases to show the extreme difficulty that is often encountered in making a positive diagnosis, the protracted character of some of the cases, and the frequent agreement between the roentgenological and the tissue diagnosis.

CLARENCE V. BATEMAN, M.D.

RADIUM

Murdoch, J.: Dosage in Radium Therapy. *Brit. J. Radiol.*, 1934, iv, 256.

This article deals with an attempt to measure the dosage of irradiation absorbed by the tissue rather than the irradiation emitted from the applicator. Previous methods of recording amounts of irradiation are briefly discussed, namely, biological tests and photographic, photometric, and ionometric methods.

Stabel constructed an ionization chamber with a volume of only 2 c.mm. and as a medium in this chamber used liquid hexane instead of a gas. Instead of the terms "millicuries destroyed" and "milligram hours," the author prefers to employ the term "ergs/cm.²" as is done by Stabel. By means of the Stabel ionization chamber used in liquid, isodose charts have been plotted for the various radium containers used in the tumor center. These curves have been made for radium containers

of various lengths and sizes, and for the various screens employed. Distances up to 5 cm. have been plotted. Clinically, these principles have been applied to tumors having flat surfaces, the number of ergs/cm.² delivered to each portion of the tumor being mapped out on paper before the application was made. In cases in which the radium is mounted on Columbia paste applicators, the estimation is made as of 1 cm. or more depending upon the thickness of the paste. The corrections for curved surfaces are shown in charts, and an index of curve correction for tubes containing 13.33 mgm. is given in a table. The percentage of energy absorbed up to a depth of 5 cm. is plotted by curves and indicated in tables. The dosage obtained with various arrangements of tubes, such as in a plane, in lines, straight and curved, and in the form of a cross, and the dosage obtained with large applicators are plotted.

The author reports a number of cases, describing the molded applicators and the distribution of the tubes therein and giving the number of ergs/cm.² delivered to each part of the tumor. The conditions treated included extensive squamous-cell lesions of the neck, the bridge of the nose, and the hard palate.

The ability of the skin to withstand dosage is described as follows: 450,000 ergs/cm.² causes a slight erythema, 550,000 ergs/cm.² a frank erythema, 600,000 ergs/cm.² a deep red erythema with desquamation, and from 700,000 to 900,000 ergs/cm.² a radio-epidermitis with blisters and strong pigmentation. Dosages above 900,000 ergs/cm.² cause serious burns and radionecrosis. It is stated that the erythema dose as ordinarily applied with the X-rays amounts to 96,000 ergs/cm.², whereas when

radium is applied the erythema dose is 450,000 ergs/cm.², and that therefore the normal skin stands four times more energy in the form of gamma rays than in the form of roentgen rays. However, in these considerations the time factor seems to have been lost sight of; the radium rays are usually delivered over a much longer period of time than the X-rays. The conjunctiva tolerates a dose of 400,000 ergs/cm.² with inflammation. The mucosa of the mouth stands doses exceeding 900,000 ergs/cm.², though a dose of 800,000 ergs/cm.² causes a frank erythema. In the case of the tongue, doses stated to be from 100 to 132 mgm.-hr. per cubic centimeter are commonly used. Computations by means of the isodose charts indicate that from 3,500,000 to 4,740,000 ergs/cm.² are absorbed by the tumor itself, 3,000,000 ergs/cm.² at a distance of 1.0 cm. from the border of the tumor, and from 2,000,000 to 2,500,000 ergs/cm.² by the surface of the tongue. In uterine carcinoma, 5,000,000 ergs/cm.² or eight times the erythema dose is absorbed in the immediate vicinity of the intra-uterine tumor. The cervix receives from 2,000,000 to 5,000,000 ergs/cm.² and the vaginal mucosa from 2,000,000 to 3,000,000 ergs/cm.². In the broad ligament at a distance of 4.5 cm. from the surface, the parametrium receives a single erythema dose, namely, 600,000 ergs/cm.².

In conclusion the author emphasizes that it is the dose received and no longer the dose emitted which is of importance, and that "milligram hours" and "millicuries destroyed" should be replaced by the term "ergs/cm.²" in the reckoning of radiation dosage and treatment. A. JAMES LARKIN, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Roberts, S. R., and Kracke, R. R.: Agranulocytosis: Its Classification, with Cases and Comments. *Ann. Int. Med.*, 1931, v, 40.

The biological and diagnostic importance of leucopenia is probably as great as that of leucocytosis.

The authors classify the granulopenias as follows:

1. Acute granulopenia of unknown cause.
2. Chronic granulopenia of unknown cause.
3. Acute agranulosis with or without resulting sepsis.
4. Acute recurring agranulosis with or without resulting sepsis.
5. Chemical granulopenia caused by chemical poisons such as benzol and arsenic.
6. Septic granulopenia caused by general or localized septic processes.
7. Irradiation granulopenia, the result of exposure to roentgen and radium rays.
8. Anæmic granulopenia accompanying certain splenic, aplastic, and pernicious anæmias, acute aleukæmic lymphatic leukæmia, lymphatic leukæmia, and certain secondary anæmias with bizarre proportions of the lymphocytes and monocytes.
9. Infectious granulopenia accompanying certain acute diseases such as typhoid, typhus, measles, mumps, malaria, influenza, dengue, and certain pneumonias.
10. The granulopenia of roseola infantum.

One of every four patients and one of every two female patients between the ages of forty and sixty years may be expected to show a mild granulopenia.

Weakness, exhaustion, and fatigue, are twice as frequent in persons with granulopenia as in those with a normal white cell count. The severity of the symptoms is dependent largely upon the degree of diminution of the granulocytes. In the most severe type, namely, agranulosis, complete collapse occurs.

A clinical syndrome consisting mainly of weakness, easy exhaustion, a tendency toward fatigue, loss of strength, and inertia, associated with a decrease in the number of granulocytes is described.

SAMUEL KAHN, M.D.

Hamburger, L. P.: Angina Agranulocytica and Its Treatment. *Bull. Johns Hopkins Hosp.*, Balt., 1931, xlviii, 339.

Of the fifteen patients with agranulocytic angina whose cases are reviewed in this article fourteen were females. Eleven were forty years of age or older. All complained of sore throat and presented oropharyngeal lesions. Three exhibited areas of cutaneous gangrene. Only one had jaundice. The primary

leucocyte count averaged 900, but the individual estimates ranged from 0 to 2,300. The average percentage of polymorphonuclear cells was 9; the minimal percentage was 0 and the initial maximum was 28. Of the seven patients who recovered, one received no treatment.

Four types of the condition are distinguished: (1) the fulminating type, in which death results in a few days, (2) a type with a more prolonged course which terminates in death or recovery in a few weeks, (3) a type with recurring attacks, and (4) a subchronic type.

The author believes that the primary disorder is a decrease of the function of the granulocytic mechanism of the bone marrow with consequent agranulocytic leucopenia and a lack of the defense against infection which we have many reasons to believe is afforded in part by the polymorphonuclear leucocytes. The cause of the defect in the leucopoietic system is unknown.

The nucleotid treatment is worthy of further trial. Daily intramuscular injections of 50 cm. of leucocytic extract divided into two doses may prove beneficial.

In summarizing, Hamburger says that agranulocytic angina is a disorder usually occurring in women in the latter half of life, which is characterized as a rule by necrotic ulcerations of the fauces, the buccal mucosa, or other mucous membranes, a defect in the granulocytic system, and a leucopenia with a decreased percentage or entire absence of the granular elements of the blood. As the agranulocytosis probably precedes the sore throat, he believes that more frequent cytological examinations of the blood should be made in all clinical cases and particularly in cases of sore throat which are not true to type. The process is an infective, febrile illness of varying clinical types with a high mortality.

The condition should be treated as a life-threatening emergency by immediate and repeated blood transfusions, cautious irradiation of the skeleton by an expert roentgenotherapist, and vigorous treatment of the local lesions. The phlegmonous cervical mass has sometimes been incised to relieve respiratory obstruction, but as a rule it seems wise to abstain from surgical intervention since no localized abscess forms in the agranulocytic state.

CARL R. STEINKE, M.D.

Waters, C. A., and Firor, W. B.: Roentgenotherapy of Angina Agranulocytica. *Bull. Johns Hopkins Hosp.*, Balt., 1931, xlviii, 349.

Since Friedmann in 1927 suggested roentgen treatment in angina agranulocytosis to stimulate the bone marrow, few cases have been treated by that method alone. Recently Friedmann has re-

ported thirteen uncomplicated cases which were apparently cured by roentgen irradiation. In the majority, the blood picture showed improvement within from twenty-four to thirty-six hours after the treatment.

The original selection of one-twentieth of an erythema dose has generally been followed by the use of a larger dose filtered through filters of copper and aluminum of various sizes. The authors have used irradiation only in conjunction with other forms of treatment, but they believe a trial of roentgen therapy alone is justifiable despite the fact that the results are not as yet definitely ascertainable.

WILBUR BAILEY, M.D.

Travaglini, V.: Presacrococcygeal Tridermoma Concomitant with a Grave Developmental Anomaly of the Lower Urinary Tract. A Clinical and Pathological Contribution (Tridermoma presacrococcygeo concomitante a grave anomalia di sviluppo delle basse vie urinarie). *Ann. ital. di chir.*, 1931, x, 469.

The author reports a case of presacrococcygeal tridermoma in an infant seventeen days old. This is an extremely rare congenital teratoma. It occurs most frequently in the anterior fascia of the sacrococcygeal region. A careful review of world statistics in 1905 revealed only ninety-seven cases.

In the case reported by the author the child was practically normal up to the seventeenth day of life. At that time she became cross, cried incessantly, showed oedema of the vulvoperineal region, developed a discharge from that region, became feverish, and showed evidence of contractural abdominal pains.

Physical examination disclosed a large tumor mass in the lower part of the abdomen, acute inflammation of the labia, a moderate discharge, and a generalized perineal swelling. Close inspection of the vulvoperineal region failed to reveal the external urethral orifice. The symptoms and findings were attributed to acute retention of urine due to complete absence of the urethra.

At operation, the bladder was found extremely distended with urine and no evidence of the internal urethral orifice could be discovered. There were no signs of stenosis, synchia, or diverticula of the bladder. A large movable, semi-elastic mass the size of an adult fist was defined in the trigonal region of the bladder at the sacrococcygeal junction. Three days after a suprapubic cystotomy in which a cysto-vaginal communication was established by means of a retention catheter the infant died from acute urinary retention and severe toxæmia.

Autopsy disclosed in the presacrococcygeal region a large tumor mass which was strongly adherent to the sacral fascia and the anterior vaginal wall. Posteriorly, the congenital growth was intimately related to the vaginal vault, causing a displacement of the uterus and rectum toward the left pelvic wall. The kidneys were of the exaggerated mammalian type, with distinct lobulation. The parenchyma of

the kidneys was cystic and anæmic and contained many small hæmorrhagic infarcts.

Microscopic studies of serial sections of the teratoma disclosed the presence of embryological blastodermic layers, i.e., ectoderm, mesoderm, and endoderm, in a conglomerate mass. In the majority of the sections studied the author was able to identify elements of embryonal nervous system, elements of the respiratory apparatus, bony and cartilaginous cells, cylindroid epithelium with villi of the intestinal tract, and elements of the biliary system. Other microscopic sections presented endothelial tissue, muscular fibrillæ, dermal tissue containing sudoriferous glands, and choroid plexus and pancreatic elements. An occasional field showed dermoid and hæmorrhagic cysts with typical sarcomatous changes.

The histopathological changes observed in the right kidney were pathognomonic of hæmatogenous staphylococcal pyonephrosis secondary to hydronephrosis with some destruction of the excretory apparatus. The findings in the left kidney were typical of congenital hydronephrosis.

According to one theory, teratomata are of diplogenic origin, and according to another, they are of monogerminal blastomeric origin. The author's histopathological findings support the diplogenic theory which maintains that thermic, physical, toxic, and mechanical influences form the bases of the inclusion of one fetus in another with failure of complete development of one or the other.

In conclusion the author states that the congenital teratoma with a malignant tendency in the case reported may have possessed a vesicovaginal communication which slowly became obliterated by the progressive teratomatous metaplasia. Although the autopsy findings failed to reveal a urethra, an abnormal communication was suggested by an inflammatory process with a discharge from the vulvoperineal region and by the normal development of the patient up to the seventeenth day of life.

S. L. GOVERNALE, M.D.

Rubens-Duval, H.: Combination of Surgery and Specific Protein Therapy in the Treatment of Cancer (De l'association de la chirurgie et de la protéinothérapie spécifique des cancers). *Bull. et mém. Soc. d. chirurgiens d. Par.*, 1931, xxiii, 310.

The author calls attention to the fact that surgery and X-ray and radium irradiation are merely local attacks on cancer tissue. While they tend to suppress the cancer cells, they do not increase the reaction of the organism as a whole. Specific protein therapy, on the other hand, exerts an effect on the entire body. The specific globulins are administered by mouth no matter where the tumor is situated. This type of treatment controls and modifies the evolution of the cancer cells through the reaction of the organism as a whole and acts as a complement to surgical treatment. The author cites three cases of inoperable carcinoma in which protein therapy was administered before operation and two in which it was given after operation.

The first case was that of a woman thirty-seven years old who had a large inoperable tumor of the right breast with several metastases in the axilla. This patient received daily by mouth 1 c.cm. of a 10^{-20} dilution of globulins obtained from several epitheliomata of the breast. Several days later the tumor seemed more localized and mobile, and amputation of the breast was done.

The second case was that of a woman sixty-one years old who had a cylindrical-celled carcinoma of the rectum. The diagnosis was confirmed by biopsy. As the patient's general condition did not permit amputation of the rectum, an artificial anus was made on the left side. A small quantity of an extract made from the rectal tumor was then given in a 10^{-20} dilution. The tumor developed a pedicle and two weeks later was removed under local anesthesia after dilatation of the anus. Lawrence, who performed the operation, stated that without the general treatment it would have been impossible to operate upon the tumor locally. A year after the operation the patient was in excellent condition, there were no local rectal findings, and the artificial anus was closed.

The third case was that of a woman of forty-one years who had a recurrence in the scar of a breast amputation performed five months previously. This patient was given daily by mouth first a 10^{-20} dilution and then a 10^{-21} dilution of globulins and albumoses from cancer of the breast. The treatment was associated with general fatigue and loss of appetite. The nodules diminished somewhat and formed a subcutaneous mass with a cartilaginous consistency which seemed operable. In January, 1930, a better preparation of purified globulins from cancer of the breast was administered. After this treatment the pains ceased, the patient looked better and regained her appetite, and the tumor nodules became more cartilaginous. The nodules were then removed surgically. Histological study of the specimen showed an epithelioma with a marked defense reaction, fibrosis, a tendency toward encapsulation, and retrogression.

In the fourth case, that of a radiologist, an epithelioma developed on the right hand on the basis of a chronic radiodermatitis. Electrocoagulation of the tumor having been followed by recurrence, amputation of the three middle fingers of the right hand was done. After the operation a recurrence developed at two points. The patient was then given orally 6 ampoules of a vaccine prepared from the tumor. Two months later he felt better and the local ulcerations had healed. One of the local nodules which was removed surgically showed merely scar tissue and an inflammatory reaction.

The fifth case was that of a woman thirty-eight years of age who had had an amputation of the right breast. Three years later she was operated upon for a lymph-gland metastasis. She was then given an autogenous vaccine of cancer of the breast in a 10^{-20} dilution. Her general condition remained excellent, but a year later she had a recurrence the

size of a bean in the axillary scar. She was then given the diluted autogenous vaccine in a glass of Malaga wine. Two days later the recurrence was removed surgically. It showed a lymphoid reaction and sclerosis about the epithelioma cells.

The author states that there is a state of equilibrium between the organism and the cancer cells, and that just as a benign tumor may become malignant, a malignant tumor may become benign. The process is reversible. The latter reaction has been observed in tar cancers of the rabbits, but not in the human being. In cases treated with specific proteins metastases are rare or delayed. Whenever possible, an autogenous vaccine should be made from the particular tumor. Cancer of the stomach and of the ovary are perhaps most sensitive to protein therapy.

JACOB E. KLEIN, M.D.

GENERAL BACTERIAL, PROTOZOAN, AND PARASITIC INFECTIONS

Kolmer, J. A.: Laboratory Aids in the Diagnosis and Treatment of Surgical Septicæmia. *J. Lab. & Clin. Med.*, 1931, xvi, 685.

Kolmer defines septicæmia as a condition characterized by the more or less constant presence of pyogenic bacteria in the blood, a septic temperature, chills, and sweats.

The causative organisms are often first discovered by blood cultures. As the presence of the bacteria may be intermittent, the cultures should be taken at intervals of one or two days. Cultures should not be reported sterile until they have failed to show growth for five days. The blood for cultures is best taken from a vein draining an infected area.

The bacteriostatic activity of the blood in surgical infections may be estimated by the method of Cohen. This consists in placing a small amount of pus or culture in the bottom of a test tube and adding 5 c.cm. of blood.

Total and differential leucocyte counts are an appreciable help in the diagnosis of septicæmia. The author recommends counting the young and late metamyelocytes as the young metamyelocytes are increased in acute infections. It is best to record the number of leucocytes per cubic millimeter rather than the percentages of leucocytes as the various types of cells may be present in normal percentages when increased in number.

In treating streptococcic septicæmia with anti-streptococcus serum there is an advantage in testing several sera for their agglutinating titers although the agglutinating power of a serum is not an exact index of its efficacy and absence of agglutinins does not necessarily indicate that the serum is without specific and non-specific therapeutic value.

Before transfusion, it is always advisable to match the donors and the recipient's bloods even though they may belong to the same group. The Landsteiner method of grouping is recommended.

In immunotransfusion the author has obtained the best results by giving the donor a subcutaneous

injection of 1,000 million stock staphylococcus vaccine and using his blood four or five hours later. Hooker, Dick, and others use donors previously immunized by a vaccine prepared with the organism infecting the patient. This is given in subcutaneous injections of 500 million, 1,000 million, and 2,000 million in heat-killed vaccine on successive days. Transfusion may be done a week later. Cadham has sought to develop a method of furnishing autogenous sera to be used with normal serum from compatible donors to supply the complement deficiency so frequently present in septicemia. The method consists in injecting prepared heat-killed vaccines of the invading micro-organism into rabbits and guinea pigs and drawing the blood about the fifth day when the agglutination titer is 1:5,000. The serum of the blood of a compatible donor is diluted with equal parts of water and injected intravenously after the administration of the animal serum. The animal serum contains the antibodies while the donor's serum contains the complement.

In making skin tests for allergic sensitivity the author uses the serum selected for treatment rather than normal horse serum.

In the use of a bacteriophage it is necessary to determine whether the micro-organism is susceptible to lysis by the bacteriophage.

The author emphasizes the importance of carrying out experiments on animals to determine the toxicity of chemical agents used in the treatment of septicemia.

CLARENCE V. BATEMAN, M.D.

DUCTLESS GLANDS

Henderson, W. R.: Sexual Dysfunction in Adenomatoma of the Pituitary Body. *Endocrinology*, 1931, xv, 111.

Until recently, pituitary disorders have been satisfactorily classified into 2 groups—hyperpituitarism and hypopituitarism. The recent discovery that the anterior pituitary contains 2 chemically separable hormones, one activating growth and the other activating the reproductive functions, will serve to make clinically recognizable the states of hypoactivity of these hormones.

The study reported in this article was undertaken to discover the reasons why sexual dystrophy (manifested notably by amenorrhoea in women) accompanies both hyperpituitary and hypopituitary states, and to determine the degree of expansion of the sella turcica in relation to the disturbances of sexual function in the 367 cases of acidophilic and chromophobe pituitary adenomatoma which were admitted to the Peter Bent Brigham Hospital, Boston, in the period from 1913 to August 1, 1931.

More dependable data on sexual dysfunction in pituitary disease are provided by women than by men as the presence or absence of the menstrual cycle constitutes a reasonably accurate indication of the functional activity of the reproductive organs.

The acidophilic cells of the anterior lobe of the pituitary gland may elaborate the hormone of

growth and the basophilic cells may elaborate the sex hormone. Experimental evidence regarding the dual hormones has been recently assembled by Teel and Cushing. However, it is not definitely known whether the 2 types of cells are separate elements of activity or, as is believed by Rémy-Collin, represent different stages in the activity of the same element.

There are 2 principal types of adenoma of the anterior lobe of the pituitary gland which occur chiefly in adults. The more common is the chromophobe adenoma composed of non-granular cells which have no known secretory activity. The less common is the adenoma associated with acromegaly, which is invariably composed of acidophilic elements. Adenomata of both varieties usually distend the sella turcica and involve the optic chiasm. The resulting impairment of sight brings the patient under neurosurgical observation.

Cases of disturbances of menstruation associated with a pituitary adenoma are divided into the following groups:

Group 1. Those in which normal menstruation was uninterrupted up to the date of the patient's admission to the hospital in spite of the presence of well-marked signs of pituitary disease.

Group 2. Those in which menstruation became irregular at the onset of the disease, usually with prolongation of the interval to from two to three months.

Group 3. Those in which menstruation continued regularly for a time, perhaps for several years, after the appearance of the disease, but subsequently ceased so that a definite "postsymptomatic" amenorrhoea was present at the time of the patient's admission to the hospital.

Group 4. Those in which the amenorrhoea coincided with the appearance of the other symptoms, the disorder in many instances having become apparent during a pregnancy after which menstruation never returned.

Group 5. Those in which the amenorrhoea preceded the appearance of other symptoms—"presymptomatic" amenorrhoea.

The pituitary fossae are classified as small, medium, or large on the basis of the roentgen-ray findings.

The chromophile adenoma makes its presence known by the unmistakable appearance of acromegaly. The 73 cases of acromegaly in females reviewed by the author are arranged in a table showing a gradual transition from the cases with normal menstruation and a small sella to those with complete amenorrhoea and a large sella.

As typical of the 10 cases with a small sella and continued normal menstruation, Henderson cites a case in which there was progressive acromegaly for fourteen years, but no failure of vision or other neighborhood signs.

In a case typical of the 16 cases with normal menstruation for a time after the acromegaly became apparent there was progressive acromegaly of

seven years' duration. Menstruation continued normally for three and a half years, but then became irregular and finally ceased. The sella showed medium enlargement. There was a slight blurring of vision.

In all except 1 of the cases with a large sella menstruation had ceased. In these cases there were visual field defects.

The chromophobe adenoma produces amenorrhœa long before it is recognized from the primary symptom of failing vision. Notable exceptions to this occur in the small but well-defined group of cases of suprasellar adenomata in which the sella shows no enlargement and menstruation remains unaffected.

The tabulation of the chromophobe adenomata shows that in 80 per cent of the cases the onset of eye signs was preceded by amenorrhœa for a long time. In 8 cases with normal or only irregular menstruation a suprasellar adenoma with early eye signs was demonstrated.

In a case of intrasellar chromophobe adenoma with a fairly typical history there was a sudden onset of amenorrhœa one and one-half years before the onset of progressive failure of vision. Partial extirpation of the adenoma was followed by recovery of vision, but the amenorrhœa persisted.

As typical of cases of chromophobe adenoma in which the tumor does not expand the sella and menstruation remains normal, the author cites a case in which there were progressive bitemporal field defects and a transfrontal exploration was done with the removal of a suprasellar adenoma.

All of the cases in which pregnancy occurred after the onset of acromegaly or a chromophobe adenoma are grouped together.

It was assumed that when the adenoma had reached a size sufficient to expand the sella widely, the basophilic elements were compressed to such a

degree that their secretory activity in starting the ovulatory cycle was interrupted.

Particular importance is attached to the group of cases in which menstruation returned after an operation relieving the compression of the basophilic elements.

Of the 27 acromegalic women under fifty years of age who had amenorrhœa and were operated upon (almost invariably for the relief of chiasmal symptoms), 5 had a postoperative return of normal menstruation. One patient who had had amenorrhœa for twelve months began to menstruate normally two months after the operation, became pregnant five months later, and had a normal full-term parturition.

Of the 70 women with adenomata of the chromophobe type, 5 had a return of regular menstruation following operation. There were no examples in the series of patients with a widely ballooned sella in whom there was either a spontaneous or a postoperative resumption of menstruation.

Sexual dysfunction in the male due to pituitary adenoma, is mentioned only briefly.

From his analysis of the disorders of sex in 367 cases of hypophyseal adenomata the author concludes that sexual dysfunction occurs only when the sella turcica has become considerably expanded, and that there is no difference in this respect between the two common types of adenoma. Therefore the sexual dysfunction may be assumed to be due solely to the compression of the basophilic cells by the space-occupying lesion. Supporting this mechanical theory is the fact that the normal menstrual cycle may be resumed and pregnancy may occur after radical extirpation of the adenoma.

The article is illustrated with roentgenograms and drawings and is supplemented by a comprehensive bibliography. Eight cases are reported in detail.

J. EDWIN KIRKPATRICK, M. D.

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INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1931

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Jefferson, G., and Whitehead, R.: A Papilliferous Cystoma of the Petrous Bone Associated with a Hypernephroma and a Cystic Pancreas. *Brit. J. Surg.*, 1931, xix, 55.

In the case reported, that of a man twenty-three years of age, the syndrome suggested an acoustic neuroma, but autopsy disclosed a peculiar papillomatous growth which appeared to be primary in the right petrous bone. Autopsy revealed also cysts of the pancreas, a hypernephroma of the right kidney, and cysts of the epididymis. The picture suggested Lindau's disease except that the unusual papilliferous cystoma was found instead of a hæmangioblastoma of the cerebellum. Lindau, to whom the authors submitted slides, was of the opinion that the tumor might have been related to the hæmangioblastoma of the central nervous system as it apparently arose from the anlage of the choroidal system derived from the neural crest.

LEO M. DAVIDOFF, M.D.

Ivy, R. H., and Curtis, L.: Operative Treatment of Losses of Substance of the Mandible, with Special Reference to Fixation of Edentulous Fragments. *Surg., Gynec. & Obst.*, 1931, lxi, 849.

In cases of loss of substance of the mandible the two fragments are usually bound together by scar tissue and complete reduction is seldom possible by manipulation. Function is greatly impaired, and there is external deformity.

The presence of teeth in each fragment is a great help in maintaining the fragments in position. When the fragments are edentulous the treatment is complicated.

The authors describe the treatment of cases in which there is a loss of substance in the molar and premolar regions with an edentulous posterior fragment that is pulled up out of position by the closing muscles of the jaw. Many dental appliances have been described for the reduction of this fragment,

but they are complicated and slough and may cause infection.

In the procedure described the nail extension principle is used. In the first stage the posterior fragment is entirely freed and reduced to its correct position, if possible without cutting through the buccal mucosa. All tissues and scar bands are liberated to allow easy complete reduction. A drill hole is made through the jaw just above the angle, a double strand of wire put through the hole and brought out of the wound posteriorly, and the wound closed around the wire. A plaster cap is then put on the head and in it is incorporated a heavy piece of wire with a loop extending down on the neck behind the ear. The wire from the jaw is fastened to the wire in the cap by a heavy rubber band under sufficient tension to keep the fragment in position. The other fragment is held in occlusion by interdental wires or some sort of dental splint.

The second stage of the operation is performed from two to eight weeks later. After isolation of the ends of the fragments and the removal of all scar tissue between them the ends are freshened and holes are drilled through them. If the oral mucosa is opened the operation must be delayed until complete healing has occurred again. A bone graft is taken from the crest of the ilium and wired across the defect. The wound is then closed in layers.

The head cap and traction on the posterior fragment are removed after four weeks. The other fragment is left wired in place for twelve weeks. At the end of that time union is usually solid and any missing teeth may be replaced by plates.

An illustrative case is reported.

JAMES B. BROWN, M.D.

EYE

Duke-Elder, W. S.: The Metabolism of the Eye: II. Clinical Applications. *Arch. Ophthalm.*, 1931, vi, 158.

The author deals with the metabolism of the eye from the chemical and physiological standpoints.

He discusses the relation of glaucoma to external pressure on the globe as a result of the action of the extra-ocular muscles, an alteration of the equilibrium level, and a change in the volume of the contents of the globe. He attributes changes in the vitreous following trauma or inflammations to the loss of fluid content and the deposition of the residual protein in coagel form. He states that the precursor and primary factor of detachment of the retina is a change in the vitreous body with partial liquefaction and segregation into coagel formations which determine lines of force. Cataract, he believes, is the result of a physicochemical disturbance between the intra-ocular fluids and the lens in which the most important factor is the capsule.

VIRGIL WESCOTT, M.D.

Wilson, R. P.: A Discussion on the Etiology of Trachoma with Special Reference to Bacterium Granulosis (Noguchi). *Brit. J. Ophthalm.*, 1931, xv, 433.

Noguchi isolated a gram-negative bacillus which, in the monkey, produced a conjunctivitis closely resembling trachoma in man. Since the publication of his work many others have reported the isolation of this bacillus with positive and negative results in transmission. Wilson states that monkeys may suffer from true trachoma, but that the clinical course of the disease in the monkey never follows the clinical course of the condition in man.

VIRGIL WESCOTT, M.D.

MacCallan, A. F.: The Epidemiology of Trachoma. *Brit. J. Ophthalm.*, 1931, xv, 369.

Trachoma is a chronic contagious disease of the conjunctiva characterized by the new formation of lymphoid tissue. It usually spreads to the cornea with resulting diminution of vision and is accompanied by cicatrization of the affected tissue. It never leads to the sudden onset of blindness. The serious defects occur rather late. It is manifested in widely differing forms.

Trachoma has a very ancient history. There is evidence that it occurred in Egypt in the nineteenth century B.C.

On the basis of the comparative prominence of lymphoid follicles or granulations, papillary hypertrophy, and connective tissue formation, MacCallan distinguishes four stages of the disease:

Stage 1. Pinhead follicles.

Stage 2. *a*, large and gelatinous follicles; *b*, papillary enlargement in addition to follicles; *c*, follicles and the complications of spring catarrh; and *d*, gonococcal conjunctivitis.

Stage 3. Cicatrization begun. Condition often not contagious.

Stage 4. Cicatrization complete. Condition not contagious.

The clinical evidence of contagion in trachoma is undoubted. The condition is localized to the conjunctiva. Involvement of only one eye is rare. No known form of immunity to the disease is known.

In 1927, Noguchi described the bacterium granulosis as the cause of trachoma. This was isolated from cases of trachoma among the North American Indians. Until the alleged specific organism is isolated in Egypt, where trachoma was first known, judgment must be suspended. In human trachoma, pannus is always manifested at some time, generally very early.

No race of men is immune to trachoma. The incidence of the condition could be determined accurately only by examining the cornea of every apparently healthy eye with the slit-lamp or a loop magnifying by ten. A reliable method of determining it would be the systematic examination of the children in the primary schools. A fairly satisfactory method would be the recording of the results of the preliminary physical examination by an oculist of army recruits. A less satisfactory method, though often the only one possible, is an estimation of the incidence of the condition by oculists who know the country. Another method would be the examination of samples of the population. Estimates based on official statistics compiled from compulsory notification, the number of cases in proportion to cases of other ocular diseases seen at ophthalmic clinics, the absolute number of cases known to oculists or general practitioners in a town, and the number of cases of blindness due to the condition are worthless.

The author divides the countries of the world into four groups according to the degree of trachomatous infection as follows:

1. Disease general: Egypt, the Levant, Morocco, Algeria, Tunisia, Palestine, Arabia, Persia, and Iraq.

2. Disease very common: Italy, Greece, Corsica, Sardinia, Poland, Lithuania, Latvia, Estonia, Finland, Czechoslovakia, Russia, China, Indo-China, Japan, Argentina, Mexico and Turkey.

3. Disease occasional, with heavy local infections: Ireland, Holland, Belgium, France, Spain, Portugal, Hungary, Austria, Germany (especially East Prussia), Albania, Jugo-Slavia, Bulgaria, Roumania, Australia, and the United States (among the Indians).

4. Disease rare: England, Scotland, Wales, Norway, Sweden, Denmark, New Zealand, and Canada.

Infectivity seems to vary with the source of the contagion and the condition of the conjunctiva of the recipient. According to the author's experience, trachomatous children are more dangerous than trachomatous adults. Infection may occur at any age. Children are more susceptible than adults. The state of the general health has no important relation to liability to infection on exposure.

Temperature and humidity have nothing to do with the spread of trachoma. Certain physical factors, such as the brick dust of crumbling ancient cities, have a great influence on the severity of the condition in countries in which it is very common and probably help to spread it in countries in which it is less common.

The upper ranks of society can be kept free from the infection by careful discrimination in the selection of household employees. Chief among the conditions favoring a general mass contagion is poverty resulting in bad housing, a poor water supply, overcrowding, and dirt.

There is no difference in the incidence of the condition in males and females. Immigration of trachomatous persons may lead to a formidable trachomatous infection of the indigenous population. Traumatism probably plays no part.

To prevent infection with trachoma, rubbing of the eyes with the fingers and the use of handkerchiefs, towels, and bed linen belonging to others should be avoided. Persons with trachoma should not fondle children. Flies and other insects which may carry the infection should be eliminated. Oculists inspecting school children should exercise great care not to transfer the infection to normal eyes. They should use rubber gloves and antiseptic solutions. In countries where the disease is more or less rare, separate schools should be provided for trachomatous children, but in countries where the condition is common this would be too expensive. The visual acuity of all children should be tested. In the author's opinion, treatment in the schools is the most important prophylactic measure because it prevents the trachomatous child from spreading the infection and is the best preventive of blindness.

With regard to the prevention of the spread of the condition in the army and navy the author says that it is dangerous to incorporate units infected with a contagious stage of trachoma in a regiment or ship's company of healthy men. On demobilization of military or naval forces, contagious trachomatous units should be retained with their regiments for daily treatment by experts or drafted under full pay for treatment in military hospitals. They need not be detained for more than three months.

National prophylactic measures must include efforts to raise the standard of living. Up to the present time legislation to compel prophylaxis has not been very successful. The instructions issued by the Supreme Council of Public Health in France are excellent.

Among international prophylactic measures of value is the frontier examination made in the United States of all immigrants, *La ligue contre le trachome* founded at the Pasteur Institute in Paris in 1923, and the *Organisation internationale de la lutte contre le trachome*. The purposes of the last-mentioned organization are:

1. To encourage the collaboration of the various organizations which are fighting trachoma.
2. To work with international public health organizations.
3. To carry out investigations regarding the geographical incidence, gravity, and sequelæ of the disease.
4. To study all measures relative to the fight against trachoma, to assist in these measures, and to propose their propagation.

5. To organize meetings to consolidate the scientific bases of the fight against trachoma, to study the problems of its causes, diagnosis, pathology, treatment, and prevention, and to investigate the scientific and social questions involved in order that any legislative measures indicated may be proposed.

LESLIE L. MCCOY, M.D.

Lazar, N. K.: Ophthalmia Neonatorum Not Due to the Gonococcus. *Arch. Ophthalm.*, 1931, vi, 32.

Of a series of eighty cases of ophthalmia of the newborn which are reviewed by the author, thirty-six were of gonorrhoeal origin. In fourteen no organism was found. In thirteen, scraping and culture revealed the pneumococcus, in three, the staphylococcus; in three, mixed organisms; and in one, the Morax-Axenfeld bacillus. In the remainder, an organism was discovered on scraping and not on culture or vice versa.

Inclusion bodies were found in cases showing organisms as well as in those showing no organisms.

It is believed that a distinct type of ophthalmia neonatorum due to organisms other than gonococci can be demonstrated on proper bacteriological investigation. For such an investigation epithelial scrapings must be used rather than the smear ordinarily employed.

LESLIE L. MCCOY, M.D.

Vail, D. T., Jr.: Adult Hereditary Anterior Megalophthalmos Sine Glaucoma: A Definite Disease Entity, with Special Reference to the Extraction of Cataract. *Arch. Ophthalm.*, 1931, vi, 39.

Anterior megalophthalmos is a hereditary, sex-linked, bilateral disease found almost exclusively in males. It is characterized by an enlarged cornea, a deep chamber, and atrophy of the iris beginning at the periphery and probably progressing toward the margin of the pupil, involving the dilator muscle but not the sphincter, and resulting in miosis. The peculiar "target" reflex seems to be pathognomonic of this atrophic condition of the iris, the zones of which represent the pupil, sphincter, atrophied iris, angle, ciliary body, and ora serrata. Iridodonesis and tremulous lens are frequently found. There is no evidence of glaucoma except possibly later in life or after the occurrence of complete dislocation of the lens. The evolution of the disease leads to the development of cataract which is probably always of the cataracta complicata type and can be successfully removed with restoration of useful vision. The operation is more difficult and complications are more frequent than in the ordinary case.

By some, the condition has been regarded as an arrested buphthalmos or hydrophthalmos; by others, as a manifestation of gigantism or overgrowth of the entire eyeball; by a third group, as the result of a hereditary tendency plus disease; and by a fourth group, as a manifestation of atavism. The theory that the enlargement is due to pressure was rejected by Seefelder because of: (1) the absence of corneal opacities and of tears in Descemet's membrane, (2) the absence of widening of the limbus in spite of

enlargement of the anterior part of the eye, (3) the sharp definition of the corneoscleral margin, (4) the normal appearance of the sclera in the region of the anterior chamber, (5) the absence of excavation of the optic nerve, (6) the absence of functional disturbances apart from the optical error, (7) the presence of a relatively high astigmatism not against the rule as in hydrophthalmos, (8) the shorter than normal radius of the curvature of the cornea, (9) the normal tension recorded by the tonometer, and (10) the absolute correspondence in the proportions of the two eyes.

Kestenbaum compared the condition with hydrophthalmos as follows:

Megalocornea	Hydrophthalmos
1. Occurs almost exclusively in males	1. Ratio of males to females affected 5:3.
2. Almost always bilateral.	2. Unilateral in 35 per cent of cases.
3. Enlargement almost equal in both eyes.	3. Enlargement unequal.
4. Convexity of cornea normal (42 to 45 diopters, Kayser, 40 to 45 diopters, Staehli).	4. Important decrease in corneal convexity; 37 diopters not rare.
5. Occurrence of embryotoxon very frequent.	5. Embryotoxon not observed.
6. Of familial occurrence in majority of cases.	6. Familial occurrence rare.
7. No ill effects during puberty (Reiss).	7. Usually ill effects during puberty.

The author believes that megalocornea is a hereditary hyperplasia of the cornea, perhaps atavistic, which is followed by a pathological process at first absorptive and later toxic. He states that we have yet to determine whether the absorptive process is a result of embryonic activity involving the mesoblastic tissue of the iris which extends into middle life, whether the clue to the etiology of the condition lies in its association with arachnodactylia and calcium deficiency, and whether the enlargement involves the entire eyeball or merely the anterior segment.

LESLIE L. MCCOY, M.D.

Rados, A.: Lymphorrhagia Retinae Traumatica. *Arch. Ophth.*, 1931, vi, 93.

Rados reports a case of retinal lymphorrhagia following a fall from a horse which resulted in slight injury to the right side of the chest. There was no evidence of skull fracture and no loss of consciousness. The visual disturbances—scotomata and a decrease in vision—were manifested immediately. The pathological changes cleared up in a short time, leaving only a fine temporal pallor of the disk and small paracentral scotomata. The clinical picture was comparable to that of albuminuric retinitis.

Typical lymphorrhagia of the retina (Furtcher) appears within a short time following injuries to the head or chest. The changes are usually unilateral. Characteristic is the presence of isolated (sometimes confluent) white patches in the inner layers of the retina which partly cover the retinal vessels. These patches appear most frequently in

the papillomacular region. They are arranged along the course of the large retinal veins. The disk, the macula, and the periphery are free from changes. The superficial position of the spots is responsible for bulging of the internal limiting membrane and a delicate fold formation of the retina. The changes are associated with punctate and ribbon-like retinal and larger preretinal areas of bleeding. They are characterized by a tendency to disappear rapidly and completely. As the white spots disappear, the small ribbon-like areas of bleeding are revealed. The spots usually disappear without leaving a trace, and the condition clears up completely without any disturbance of vision. Frequently, however, a slight pallor of the temporal part of the disk or paracentral crescent-shaped scotomata may persist. The cause of the spots is the fluid deposited in new locations.

LESLIE L. MCCOY, M.D.

EAR

Pohlman, A. G.: The Interpretation of Conduction Deafness: A Report of Two Unusual Cases. *Arch. Otolaryngol.*, 1931, xiv, 48.

The author states that the apparatus for the transmission of sound is about equally efficient in the transmission of all audiofrequencies to the cochlea.

The generally accepted theory that conduction deafness results in greater losses of acuity of hearing of low-pitch tones because the apparatus for the transmission of sound is more efficient at the lower end of the pitch range is incorrect.

The fact that relatively greater losses in acuity occur at the lower end of the frequency range is dependent on an equal efficiency in the apparatus for the transmission of sound and on the correlation between the range of sensitivity and intensity at the various levels of the perceptive apparatus. Conduction deafness therefore merely brings to consciousness the normal reaction of the internal ear itself.

JAMES C. BRASWELL, M.D.

Barber, H. W.: Eruptions Involving the External Auditory Meatus. *Proc. Roy. Soc. Med., Lond.*, 1931, xxiv, 1393.

The author states that while true eczema of internal origin sometimes occurs in the external auditory meatus, most so-called eczemas of this region are examples of infective meatitis. In infancy, adolescence, and early adult life true eczema of the ears is usually part of the allergic syndrome, viz., eczema, prurigo of Besnier, paroxysmal rhinitis, asthma, urticaria, and migraine. About 25 per cent of the patients are ichthyotic. In later life eczema of the ears of the type formerly designated as "gouty" is fairly common. Persons with this condition are often plethoric and fat or thin and arteriosclerotic. The blood pressure is frequently raised, and albuminuria may be present. Spa treatment designed to increase elimination is usually successful.

JAMES C. BRASWELL, M.D.

Jerković, N.: *Blood Findings in Suppurative Inflammations of the Middle Ear and Their Complications* (Blutbefunde bei eitrigen Entzündungen des Mittelohres und deren Komplikationen). *Otolaryngol. Slav.*, 1931, iii, 13.

Practically all investigators who have made haematological studies in otology are agreed that in suppurative inflammatory processes of the ear and their complications the reaction of the blood is the same as in similar processes occurring in other parts of the body. However, in individual groups or stages of these aural diseases the blood findings show no agreement. The important question whether the blood findings in cases of uncomplicated otitis media can be differentiated from those in which a suppurative mastoiditis also exists is still unanswered. Opinions differ also as to whether characteristic blood findings are demonstrable in other complications.

The author investigated both the quantitative and qualitative components of the blood in eighty-five cases of ear conditions. The material was divided into the following groups: (1) acute or subacute otitis media in which cure resulted without trephination; (2) acute or subacute otitis media and mastoiditis without complications; (3) acute or subacute otitis media and mastoiditis with complications such as perisinous, extradural, or subperiosteal abscess; (4) chronic otitis media without acute exacerbation and with acute exacerbation; (5) severe complications such as sinus thrombosis, pyæmia, brain abscess, and meningitis. Antrotomy was performed in Groups 2 and 3, and trephination in both subgroups of Group 4.

In all six cases of the first group there was a hyperleucocytosis and, in one case, a neutrophilia. Displacement of the neutrophils to the left up to 21 per cent occurred in one-half of the cases, those with the most marked hyperleucocytosis. In one-third of the cases there was no eosinophilia, and in one-half the number of eosinophiles was diminished. The influenza virus produces a leucopenia; only the combined action of other pyogenic bacteria produces a hyperleucocytosis. The blood picture becomes normal with cure.

Of the twenty-one cases in the second group, 9 (43 per cent) showed a normal blood picture before operation. In eleven of the twelve cases in which the blood picture was changed a hyperleucocytosis was found. One case showed a slight neutrophilia. Displacement of neutrophils to the left up to 15.5 per cent occurred in five cases. Two cases showed no eosinophilia. Whereas in the group of cases of otitis media with spontaneous cure the blood findings were positive in every instance, in this group no changes in the blood were found in about half of the cases and in all except two of those in which changes were noted they were no more pronounced than in cases with a marked leucocytosis. In several cases an increase in the total number of leucocytes due probably to the operative trauma was found on the second or third day after operation.

In the third group, consisting of twenty-two cases, the acute mastoiditis complicated by perisinous, extradural, or subperiosteal abscesses showed a distinct effect on the blood picture. Hyperleucocytosis occurred in 90 per cent of the cases. Half of them showed a neutrophilia and displacement to the left. Five cases showed aneosinophilia and six a decrease in the number of neutrophils. In ten, the number of lymphocytes was diminished. The most marked changes were due to subperiosteal abscesses. There was no difference in the blood picture of cases of perisinous and extradural abscesses.

Some of the cases of acute mastoiditis showed no pathological change in the hæmogram. These were cases of the simple purulent type. As all of the cases of the second and third groups were examined bacteriologically, a possible relationship between the different types of virus and the blood pictures was sought. The excitants were the streptococcus mucosus and pyogenes and the staphylococcus pyogenes. A few of the cases were bacteriologically negative. The majority showed the streptococcus mucosus. In most of the cases of uncomplicated mastoiditis due to the streptococcus mucosus the hæmogram showed no changes. In a few, however, the picture of an acute exudative inflammation with marked hyperæmia of the mucosa and a considerable change in the blood picture was found in the beginning of the disease. In the cases of the third group, the blood findings were positive in every instance although in this group also the majority of the cases were due to the streptococcus mucosus.

Of the twenty-three cases in the fourth group, nine showed no acute exacerbation; five showed a normal, or almost normal, blood picture; and the rest showed slight changes. In the second subgroup a positive change in the hæmogram was always present (usually a hyperleucocytosis). Just as in acute otitis with mastoiditis, the most marked changes in the hæmogram were found when such complications as perisinous, extradural, or subperiosteal abscesses existed. Of the total number of twenty-three cases, nineteen were operated upon radically; sixteen showed a cholesteatoma which had no relation to the blood picture.

Of the five cases in the fifth group, all showed marked changes in the blood picture before operation. Hyperleucocytosis occurred in every case, neutrophilia in four, and displacement to the left in all. Eosinophiles were absent in two cases and a hypo-eosinophilia was found in three. The lymphocytes were decreased in four cases. In all of the eight cases with complications in the brain or meninges the blood picture indicated severe disease.

In acute and subacute middle ear inflammations which were without complications and were cured by conservative treatment the changes in the blood picture were no less marked than those occurring in many of the cases of mastoiditis. Some of the cases of acute otitis with mastoiditis showed a normal hæmogram, while in others the hæmogram was considerably changed. The latter were almost exclusively

cases in which the suppurative process had progressed into the soft parts. Hence the blood findings are of no special aid in the differentiation of acute and subacute otitis media without mastoiditis from acute and subacute otitis media with mastoiditis. Nevertheless there is a group of cases in which the hæmogram may be of diagnostic aid, viz., cases of mastoiditis due to the streptococcus mucosus. This statement refers, not to the differential diagnosis between an ordinary otitis media and mastoiditis (in infections due to the streptococcus mucosus such a differential diagnosis is impossible from the blood picture), but to the exclusion of other complications.

Cases of chronic otitis media with mastoiditis which presented clinical signs of acute exacerbation and required radical operative treatment showed marked changes in the blood picture, especially in the presence of perisinous, extradural, or subperiosteal abscesses. In such cases the blood findings, which corresponded to the clinical picture and the anatomical changes, may serve as an aid in the diagnosis and the establishment of the indications for treatment.

In thrombosis, the author's findings indicated only that a severe disease process was present. The hæmogram gave no information as to the localization of the disease. This was true also in cases of brain abscess.

In otogenous meningitis, the blood picture may be of service in the differentiation between a suppurative otogenous meningitis and a tuberculous process, but the otogenous meningitis itself does not differ from other severe otogenous complications.

In severe as well as mild complications the hæmogram is of most value in the prognosis and the control of the postoperative course. All of the author's fatal cases of severe otogenic complications showed most marked changes in all of the components of the blood picture—hyperleucocytosis, aneosinophilia, neutrophilia, and displacement to the left. In the cured cases, on the other hand, at least one of these changes was absent or all of them were less pronounced. After operation a change in the blood picture was of greater aid in the early diagnosis of complications than any other clinical sign.

The author draws the following conclusions.

1. It is impossible to differentiate an uncomplicated acute otitis media from an acute otitis media with mastoiditis on the basis of the blood picture.
2. In otitis due to the streptococcus mucosus the blood picture will reveal the presence of a perisinous and extradural abscess with a considerable degree of certainty.
3. It will be of aid also in the diagnosis of acute exacerbations of chronic processes.
4. Most often it makes possible the diagnosis of severe complications.
5. In cases with severe complications it will aid in the establishment of the prognosis.
6. It is a reliable index of the postoperative course of the disease.

LOUIS NEUWELT, M.D.

Watkyn-Thomas, F. W.: Vertigo in Suppurative Conditions of the Middle Ear. *Brit. M. J.*, 1931, i, 242.

In circumscribed labyrinthitis the labyrinth cavity is unaffected. A mastoid operation, either partial or complete, must be done to expose the diseased area of the labyrinth wall. The diseased area must not be interfered with in any way. As a rule no labyrinth operation should be done. The only exceptions are the rare cases in which the erosion does not heal and incapacitating vertigo persists. In such cases it may be necessary to destroy the labyrinth. This is best done by injecting alcohol through the fistula. The operation, although simple, is not devoid of risk, and should be undertaken only as a last resort.

In serous labyrinthitis the defences are obviously adequate. Unless signs of a suppurative invasion appear, no operation of any sort should be done until all of the signs of the attack have passed off. A radical mastoid operation should then be performed.

In diffuse suppurative labyrinthitis the labyrinth should be opened and drained as soon as destruction is complete, as shown by the caloric test. Any operation performed in cases of latent labyrinthitis should include drainage of the labyrinth unless it has already been obliterated by fibrous tissue.

JAMES C. BRASWELL, M.D.

NOSE AND SINUSES

Koslin, I. I.: Primary Staphylococcus Infections of the Nose, Lips, and Face. *Ann. Surg.*, 1931, xciv, 7.

Staphylococcus infections of the nose, lips, and face have a high mortality after a comparatively short illness. The proper treatment is still debatable.

As the skin of the face is quite thin, extremely vascular, and rich in glands and hair follicles, it is particularly susceptible to infection by staphylococci. The venous network of the face, lips, nose, and cavernous sinus are united through a complicated structure of superficial veins. The facial vein which communicates with the cavernous sinus and receives tributaries from the nose, lips, and facial veins is a patent vein which has no valves. When cut, it does not collapse and obliterate its lumen, but remains open and offers little resistance to the spread of infection in either direction.

There is no communication between the lymph of the skull and that of the face, lips, or nose.

The severity of infections depends upon the resistance of the host, the virulence and numbers of the organisms, the patient's susceptibility, and the specific responses of the body.

Death following a primary staphylococcus infection of the nose, lips, or face is due to some intervening infection such as pneumonia or to the primary infection and a blood-stream infection with or without metastatic abscesses, thrombosis of the facial vein and possibly of the cavernous sinus, or meningitis.

The secondary complications which may develop from spreading of the primary infection occur primarily by extension through the lumen of the venous networks rather than through the lymphatics. The lymph can flow in only one direction, that is, toward the heart, and infections which spread through the lymphatics appear to be limited to a local spread.

The treatment is of two types: operative and non-operative. Incisions open the lymphatics and venous channels to further absorption of infection and have the same effect on the organic barrier of defense as trauma produced by squeezing or picking.

Ligation of the facial vein is not to be recommended as it may dislodge a thrombus and will not prevent the infection from spreading in the opposite direction.

The most satisfactory treatment is the use of warm wet dressings which increase the blood flow, thereby bringing to the area more antibacterial and immunological serum which localizes the infected area and assists in maintaining the barrier of defense and the resistance of the host. WILLIAM G. HAMM, M.D.

MOUTH

Simmons, C. C.: *The Treatment of Oral Cancer.*

Am. J. Roentgenol., 1931, xxv, 5.

The author accepts the rule adopted by the American College of Surgeons that five years must elapse before cases of carcinoma can be classified as cured. He reports on a series of 763 of oral cancer treated at the Collis P. Huntington and Massachusetts General Hospitals, Boston, during the period from 1918 to 1924. As an etiological factor of importance he cites chronic irritation from tobacco and from poorly fitting dental appliances and other foreign bodies. Leucoplakia was present in more than 20 per cent of the cases and a positive Wassermann reaction was obtained in 18.7 per cent. Irritation, leucoplakia, and syphilis are definite etiological factors. In the surgically cured cases of carcinoma of the tongue in the series reviewed the average duration of the lesion before the patient was seen by the physician was six and a half months. Only tumors of low malignancy and cell growth were cured by surgical measures. Thirty per cent of 340 patients received poor advice from the first physician consulted.

The treatment of cancer of the mouth may be surgery, irradiation, or a combination of these methods. It includes treatment of the original growth and treatment of the lymphatic areas. The anatomical location of the tumor must be considered. The prognosis depends more upon the degree of malignancy as revealed by microscopic examination than upon any other factor. A cure was obtained in 66 per cent of 30 cases of Grade 1, 34 per cent of 31 cases of Grade 2, 8 per cent of 24 cases of Grade 3, and none of 15 cases of Grade 4. The degree of malignancy can often be estimated clinically. The papillary carcinoma of the cheek arising in leucoplakia of long standing is usually of low ma-

lignancy, while the nodular, ulcerated carcinoma of the tongue or the floor of the mouth is highly malignant. The lympho-epithelioma of the tonsil is highly malignant, but extremely radiosensitive. In 92 primary cases without evidence of metastasis operability was 38 per cent and operative mortality was 0.9 per cent.

Radical operation is defined as excision of the local growth with the knife or cautery and removal of the glands of the neck on the adjacent side together with the sternomastoid muscle and the internal jugular vein from the base of the skull to the clavicle. The operation is done in 2 stages with an interval of ten days between the stages. Incomplete operation is defined as wide local excision of the growth. In the cases reviewed, irradiation treatment consisted almost exclusively of the local use of radon seeds. Since 1923, seeds of the gold type have been employed.

Externally, the X-rays were used in preference to radium for the treatment of glands of the neck as the supply of radium was limited. The irradiation consisted of a series of 4 treatments of 800 r units each, measured in air, at a distance of 80 cm. and of approximately two hours' duration. Two or more portals were used. When gamma irradiation was employed the patient received 32,000 mc.-hr. at a distance of 10 cm. with filtration of 2 mm. of lead over 2 portals.

The treatment cannot be reduced to fixed rules. Each case must be considered separately. At the outset it is necessary to determine whether a permanent cure or only palliation can be expected. Of the 763 patients whose cases are reviewed, only 227 (30 per cent) showed no clinical evidence of metastasis, and only 48 (6 1/6 per cent of the total number) were operated upon radically. Radical dissection of the neck when cancerous glands are present may disseminate the disease. However, cancerous glands sometimes cannot be palpated and palpable glands are not always malignant.

In the treatment of local growths without evidence of metastasis, 1 of several methods may be used to destroy the local growth. In the cases reviewed, operation was chosen. When bone was involved, surgery was always preferred to radium irradiation. In local operative procedures the electrosurgical knife was used, and in certain cases radon seeds were implanted in the wound. Irradiation preliminary to surgical excision has not been advised.

An incomplete operation was done in 73 cases without evidence of glandular metastases. Thirty-eight per cent of the patients were living and well five years later, but in all of these the lesion was of a low grade of malignancy. In suitable early cases without evidence of glandular metastases a radical dissection of one side of the neck is advisable. In the cases reviewed, postoperative prophylactic irradiation was not given routinely.

The radical 2-stage operation was performed in 23 cases in which glands were proved cancerous. A cure was obtained in 17 per cent, whereas in 25 cases in

which the glands were not involved the incidence of cure was 34 per cent. The total operative mortality was 2 per cent.

In cases of small lesions of the mouth in patients unsuitable for radical surgery, local dissection was done or the lesion was treated with radon seeds. High-voltage X-ray treatment was given to the lymphatics of the neck.

In cases of highly malignant carcinoma of the tongue the treatment usually consisted of local excision of the growth with the implantation of radon seeds or the use of the seeds alone followed by irradiation of the glandular areas of the neck. When metastasis has occurred there is little hope of cure by any method.

Lympho-epithelioma of the tonsil was treated with radon seeds and X-ray irradiation of the neck. The treatment of cases with clinically obvious metastases consisted in the implantation of radon seeds and high-voltage X-ray treatment of the glands of the neck. If possible, complete excision was done. Individual glands were treated by the implantation of seeds in addition to routine X-ray irradiation. Occasionally, 16,000 mc.-hr. were given externally by the technique described. Of 219 patients with advanced lesions who were treated by irradiation in the period between 1918 and 1924, all are dead of the disease, but if the cases of these patients are compared with a group of similar cases which were untreated it appears that life was prolonged by the irradiation. Irradiation prolonged life also in cases of recurrence after operation.

A. JAMES LARKIN, M.D.

Stewart F. W.: The Structure of Intra-Oral Carcinoma in Relation to Radiosensitivity, Tissue Dosage, and Adequate Therapy. *Am. J. Roentgenol.* 1931, xxvi, 1.

While the relationship between the histological structure of a tumor and its behavior under irradiation has been recognized for many years, efforts to calculate the required dosage based upon this relationship have been made only recently. The results of such efforts have been encouraging.

The author cites tumors illustrative of this relationship. The first was a squamous-cell carcinoma of Grade 2 which was radioresistant to a known extent of 420 per cent of a skin erythema dose over a period of twenty days. The second, a carcinoma of the same type and grade, underwent complete regression when treated with 960 per cent of a skin erythema dose. A node in this case received 320 per cent of a skin erythema dose, which was sublethal. These tumors indicate that 420 per cent of a skin erythema dose is the maximum sublethal dose for a metastatic node of squamous-cell carcinoma of Grade 2. From thirty-two cases of squamous-cell carcinoma, Martin, Quimby, and Pack concluded that the lethal dose ranges from 6 skin erythema doses upward, that the average lethal dose is between 8 and 10 skin erythema doses, and that a dose between 1 and 6 skin erythema doses is sublethal.

The author cites also an epidermoid carcinoma of Grade 3 which received a lethal dose of 1,500 per cent of a skin erythema dose in the primary mass and a dose of 1,070 and 1,130 per cent of a skin erythema dose respectively in the two secondary masses. A later recurrence in an area which had received 355 per cent of a skin erythema dose indicates that the lethal dose in this type of tumor exceeds 4 skin erythema doses.

In a case of squamous carcinoma of the mouth of Grade 3 the primary growth healed under treatment with gold implants and external irradiation. One node received 915 per cent and another received 340 per cent of a skin erythema dose. The former progressed, but the latter showed microscopic evidence of activity. In this case, therefore, the lethal dose exceeded 5.5 skin erythema doses.

It was noted that lesions lying anterior to the line of Waldeyer's ring in general were squamous-celled lesions and radioresistant, whereas many of those lying back of Waldeyer's ring were radiosensitive, in one instance undergoing complete regression when subjected to as little as 1.4 skin erythema dose. Not infrequently carcinoma of the larynx is of this transitional-cell type. In a case of laryngeal tumor of Grade 3, 4 skin erythema doses with the high-voltage X-ray resulted in complete regression.

The author concludes that squamous carcinoma of the anterior oral cavity should be treated by local and external irradiation while epidermoid carcinoma of the posterior oral cavity, nasopharynx, pyriform nasal sinuses, and extrinsic larynx may be cured by external irradiation alone provided they do not show fully developed squamous cells.

A. JAMES LARKIN, M.D.

Grier, G. W.: The Treatment of Malignant Lesions of the Mouth by Contact Applications of Radium. *Am. J. Roentgenol.*, 1931, xxvi, 23.

Grier believes that carcinoma of the mouth is best treated with contact applicators containing radium. He employs radium element in the form of 115-mgm. needles placed in brass capsules with a wall 1 mm. thick. For the treatment of large lesions a number of these capsules are laid in a row, covered with a thin piece of rubber, and fastened on the end of a strip of sheet lead about $\frac{1}{4}$ in. wide and 6 in. long. The radium is placed against the lesion and held in place by bending down against the face the portion of the lead strip which projects outside the mouth and fastening it with adhesive plaster and a bandage.

C. D. HAAGENSEN, M.D.

Widmann, B. P.: Radium and Roentgen-Ray Treatment of Cancer of the Mouth. *Am. J. Roentgenol.*, 1931, xxvi, 12.

In the last ten years the radium treatment of intra-oral cancer has been advanced especially by the work of Quick and Regaud. Gold seeds have been found of tremendous value, and the development of a systematic plan of dosage with mathematical precision has helped greatly. Regaud demonstrated

that in carcinoma of the cervix low intensities of irradiation continued over from five to ten days with the hard gamma rays obtained by the use of from 1.0 to 2.0 mm. of platinum decidedly improved the end-results. This principle of heavy filtration and low intensity has been applied to the treatment of intra-oral carcinoma with considerable success. Needles of platinum from 15 to 45 mm. long, carrying 1.0 mgm. of radium for each 15 mm. of length, and with an average filtration of from 0.5 to 1.0 mm. have been employed. If possible, contact applications are used instead of interstitial irradiation procedures. When both contact and interstitial irradiation are employed the contact irradiation precedes the interstitial irradiation by about ten days and metals equivalent to 2.0 mm. of platinum are employed for filtration. From 60 to 70 per cent of the total dose is given by each method. When the lesions are small, electrodesiccation is done and followed immediately by the implantation of gold seeds.

The author is interested chiefly in the development of an irradiation technique designed especially for inoperable and advanced cancerous lesions of the mouth. For such lesions, short-wave irradiation seems to offer the only possibility of administering greater intensities of irradiation than have been employed ordinarily. Consequently, during the past two and a half years intra-oral cancer has been treated with surface and contact applicators of radium to the primary lesion. Filtration by 2.0 mm. of platinum admits a quantity of hard gamma irradiation which has yielded results clinically superior to those obtained by any other technique. Greater depth intensities are possible by the use of hard rays. The value of grading tumors is still under discussion, but in the author's opinion the evaluation of cellular differentiation is undoubtedly important.

As the clinical reactions obtained with heavily filtered contact applications have equaled those obtained by interstitial methods, a stock of applicators has been devised for the routine treatment of cases of cancer of the mouth. By these applicators the technique has been greatly facilitated. The "pegged" arrangement of capsules for the stock applicators is varied with single or double capsules placed parallel or at right angles as may be required by the irregularities of the floor of the mouth, the dorsum of the tongue, or other parts of the buccal cavity. The screen of 2.0 mm. of platinum admits wave lengths more penetrating and less caustic than the screen with a thickness of 0.5 mm. For reasons of economy, lead has been selected as a practical filter. Silver radon tubes plus 3.0 mm. of lead plus 1 mm. of rubber are equal to 2.0 mm. of platinum filtration at a distance of 5.0 mm. between the radium point and the tissues. Later, 4.0 mm. of brass are substituted for the 3.0 mm. of lead on account of the greater durability of brass. These applicators produce an erythema with 350 mc.-hr. in one sitting. If the dose is divided into from 150 to 200 mc.-hr. at each sitting over a period of ten days, a total dosage of 1,000 mc.-hr. can be given. Approximately 50 per cent

of the dosage is delivered at 2.0 cm. with this filtration. When this irradiation is combined with external irradiation over both sides of the neck, a total dosage from three ports of entry about the tongue equal to five erythema doses in the center of the tongue permits a total irradiation in the tongue of from six to eight erythema doses. The technique of irradiating the tongue and the dosage are described in detail. A total of from 5,000 to 6,000 mc.-hr. at a distance of 0.5 cm. can be attained within the mouth, but has been employed in only very advanced cases. The local reaction is marked throughout the buccal cavity, including the cheek, the roof of the mouth, and the tongue, and is about equal in intensity to that following the interstitial irradiation of the tongue with gold seeds.

In the treatment of the neck, all ambulatory patients are given high-voltage X-ray irradiation over two fields. Hospital patients are treated by combined methods of irradiation—roentgen irradiation with 200 kv. and filtration by 0.5 mm. of copper, and radium packs with a filtration of 3.0 mm. of lead and 0.5 mm. of silver, employed simultaneously. During the two weeks of treatment 120 per cent of a dose of roentgen rays and 125 per cent of a dose of radium are given over the same skin area. Two hundred and forty-five per cent of an erythema dose of combined irradiation is given to each side of the neck or a total of nearly 500 per cent of an erythema dose on both sides of the neck. In this way a depth dose of two and one-half erythema doses is obtained. The erythema is intense. It appears in about twenty-one days and lasts ten days. In advanced cases this irradiation is carried out more slowly, being extended over a period of from four to six weeks. By this method 350 per cent of the combined X-ray and radium irradiation has been applied to a single skin port without damage. The radium packs measure 10 by 15 cm. and are applied at a distance of 4 cm. At one sitting the erythema dose for the pack is 15,000 mc.-hr. If the treatment is divided into four sittings, a total of 20,000 mc.-hr. can be given. Therefore hospital patients receive treatment with four radium packs for forty-eight hours each to each side of the neck, a total dose of 40,000 mc.-hr. being given. This makes a total of 380 hours. On the day of rest between radium treatments roentgen-ray treatment is given to each side of the neck. A total of six 20 per cent doses is given to each side of the neck. Occasionally radium packs are used alone, as much as from 50,000 to 60,000 mc.-hr. being given to both sides of the neck in from six to eight weeks or from 15,000 to 30,000 mc.-hr. to a single skin port.

The results can be reported only in terms of clinical impressions. Ninety-two cases of advanced and inoperable intra-oral carcinoma have been treated. Cervical metastases were present in 67 per cent. Of the sixty-two patients with cervical metastasis, twenty-one are living from one to two years after the treatment and seven of these show complete clinical regression of enlarged cervical nodes. Of the

The material included twenty cases of severe Basedow's disease, a case of vegetative neurosis, and a case of the basedowoid condition described by Stern. Of the severe cases of Basedow's disease, several were treated for a considerable time without result or with only temporary benefit. In all of the cases of Basedow's disease the basal metabolism was increased up to between +86 and +25 per cent, whereas in both of the exceptions it was not increased. The preliminary treatment consisted of the administration of Lugol's solution in increasing doses from 5 to 20 drops per day. The dosage depended upon the severity of the disease. In addition, quinine and digitalis were given with excellent results. The basal metabolism was determined at intervals of two or three days from the fifth day after the beginning of the preliminary treatment. Operation was done only when the basal metabolism curve showed a tendency to fall and the general clinical symptoms seemed to indicate intervention. When the fall in the basal metabolic curve was insufficient, only ligation of the upper thyroid arteries was done at first (two cases), and at the second stage a radical operation was performed.

According to Troell, the ideal time for operation is reached when the basal metabolism is about +30 per cent. In the after-treatment in the cases reviewed iodine was given in decreasing doses for ten days. Digitalis and quinine were given for only three days after the operation. The exceptions to this rule were made in the cases of patients with disturbances of cardiac rhythm, in which the quinine treatment was continued as long as the administration of iodine. On the administration of quinine and digitalis the disturbances in rhythm sometimes cease (the effect of the quinine). While digitalis particularly, and quinine (Bram) have a slight effect upon the thyroid heart, in patients with Basedow's disease who are treated at the same time with iodine, a distinct digitalis and quinine effect is demonstrable (strengthening of the pulse and slowing of the frequency of the heart). The reserve power of the heart is increased. According to the prevailing belief, iodine medication in Basedow's disease increases the organic iodine in the thyroid gland and diminishes the iodine content of the blood and the organic thyroid hormone. This results in a lowering of the basal metabolism and, as we must assume, of the minute volume and perfusion of all of the organs. As a result of the administration of iodine, the thyroxin intoxication of the heart diminishes when digitalis and quinine are given. The authors believe that while improvement in the general condition and a certain improvement in the cardiac findings are brought about by the iodine treatment, it is incorrect to assume that the elimination of the disturbances of cardiac rhythm in Basedow's disease is due to the iodine alone as these disturbances are relieved only when iodine therapy is given after the beginning of quinine therapy. Edens also observed that on the administration of small doses of iodine the cardiac disturbances per-

sisted although there was an improvement in body weight.

The authors noted that the pulse frequency after bilateral resection of the thyroid gland was normal and in most of the cases remained normal. They believe that cases in which the pulse frequency remains high even after resection are neglected cases of Basedow's disease of long duration, in which the secondary symptoms have gradually acquired a certain independence (Rahm).

Before the operation a typical electrocardiogram is found in cases of Basedow's disease. It usually shows very high curves. Especially the size of the secondary curve appeared striking to earlier investigators. In almost all of the cases reviewed the curve was dentated before operation. In cases without a typical curve the diagnosis of Basedow's disease was frequently not verified.

In seven cases the electrocardiograms made after the operation showed a flattening of the T-wave which often persisted for weeks. Almost always, however, this wave regained its normal positive appearance after from four to six weeks. In four cases there was a pronounced negativity of the T-wave without a simultaneous severe disturbance of cardiac activity. Recovery occurred after a few weeks. In eight cases no postoperative change in the secondary curve was observed. In three a definite conclusion could not be reached. As the electrocardiographic studies were not made until fourteen days after the operation, the authors concluded that in cases in which no postoperative flattening of the T-wave was noted changes in this wave probably occurred before the electrocardiographic examination was carried out. Accordingly, in three cases they made electrocardiograms daily beginning immediately after the operation. These cases showed that the pronounced negative change of the T-wave may completely disappear within fourteen days. The authors conclude that the process in the cardiac muscle are closely related to the function of the thyroid gland. The removal of large amounts of functioning thyroid tissue apparently produces an injury of the heart muscle which causes the increased lowering of the secondary curve in the electrocardiogram. The lowest point in the T-wave is apparently reached on the third day after the operation. In about fourteen days the heart adapts itself to the new conditions which are created by the reduction of the thyroid and the electrocardiogram becomes normal.

After the operation the clinical picture and the basal metabolism change very quickly. At the end of from ten to twelve days the basal metabolism is again normal. In only one of the cases reviewed was it high (+40 per cent) after the operation.

In Basedow's disease cardiac complications of all degrees are always to be reckoned with. By operative treatment it is possible to eliminate these exceedingly important complications in addition to almost all of the other Basedow symptoms. All cases in which there is a goiter and the cardiac changes have

not reached an unusually severe degree are suitable for operative treatment. In the presence of serious cardiac insufficiency the operation is indicated only *when successful internal therapy has been given*. In general, disturbances of cardiac rhythm do not contra-indicate operation if they yield to pre-operative internal treatment. Even an absolute arrhythmia with auricular fibrillation is not a contra-indication if the cardiac frequency can be reduced and the pulse strengthened by the preliminary treatment. The authors have always been able to eliminate the extrasystole by preliminary internal treatment. As a result of the diminution of the hyperexcitability by quinidine the incidence of ventricular fibrillation during operation has greatly decreased.

In the establishment of the indications, determinations of the basal metabolism are of most importance.

With regard to the pre-operative iodine treatment the authors state that when iodine is given over a long period of time the patient may develop a certain resistance to it which may seriously affect the result of the treatment with Lugol's solution and thereby the result of the operation. In cardiac complications electrocardiographic examination is necessary for the decision as to whether operation should be undertaken or not.

In agreement with Klose, Rahm, and others, the authors believe that in every beginning case of Basedow's disease the less radical internal therapy (roentgen irradiation) or treatment at spas at a moderate elevation should be given first. Treatment with small doses of iodine is a two-edged sword. When internal treatment for from eight to ten weeks is unsuccessful, operation should be done. Cases which are too far advanced or in which the course of the disease is rapid (cardiac death) are unsuitable for operation; also cases in which there is no goiter and no increase in the basal metabolism. Success is to be expected from surgery only when there is a goiter and the basal metabolism is increased. In the vegetative neuroses operation is harmful.

There are also cases of Basedow's disease without goiter but with an increased basal metabolism. In these, the thyroid gland is usually larger than is suspected from the clinical examination and resection is indicated. The thyroid should be surgically reduced as it is the factor responsible for the development of Basedow's disease in a person with a predisposition to that condition. In severe cases of Basedow's disease after-treatment is very desirable as electrocardiographic investigations show that normal conditions of the heart may not be restored until after a period of months. LOENR (Z).

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Leriche, R.: *Hypotension of the Cerebrospinal Fluid in Traumatism of the Skull* (De l'hypotension du liquide céphalo-rachidien dans les traumatismes du crâne). *Presse méd.*, Par., 1931, xxxix, 945.

The first case reported was that of a man fifty-four years of age who had a high blood pressure and was first seen by the author when he was in semicomatose following an automobile accident. Blood and fluid were issuing from the left ear. Facial paresis was present, but there was no peripheral paralysis of the limbs. Pupillary dilatation was noted on the side of the fracture. There were no signs of compression. The pulse was 55. Eight hours after the accident, lumbar puncture brought two or three drops of a pink fluid. Immediately, in spite of an arterial tension of 19 with the Vaquez apparatus, an intravenous injection of 40 c.cm. of distilled water was given. Ten minutes later the patient sat up and said that his head felt better. Fluid still came from his ear. After five or six hours the torpor began again with a violent frontal headache. The next morning, 250 c.cm. of physiological salt solution were given subcutaneously. This treatment was followed by improvement. It was repeated until on the third day recovery was permanent. A year and a half later the patient complained only of a decrease in memory and capacity for work.

The author reports two other cases and cites numerous cases briefly. In all, the relation between the symptoms, the hypotension, and the result of the injections was striking.

The injured patient with hypotension is generally not in deep coma, but is somnolent or semicomatose. He lies flat on the bed or with his legs drawn up or on his side. He avoids light and sound and does not respond to questions. The pulse is often slow, but is sometimes slightly accelerated. The condition resembles the beginning of meningitis. The passive congestion produced by loss of the cerebrospinal fluid, which explains the symptoms of the condition, is an inevitable physiological phenomenon.

The author at first injects from 20 to 40 c.cm. of distilled water. If this is not successful at once, he gives an intravenous or subcutaneous injection of from 500 to 1,000 c.cm. of physiological salt solution.

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Learmonth, J. R., and Kernohan, J. R.: Three Cases of Epidermoid Cyst of the Brain. *Surg. Clin. North Am.*, 1931, li, 853.

In the cases reported by the authors the epidermoid cysts arose from the recognized points where

such tumors usually occur, namely, the temporo-sphenoidal groove, the median line of the cerebellum, and the median line of the basal part of the cerebrum. Such cysts are formed as the result of cell inclusions during the closing off of the cranial cavity. Chemical analysis and histological study do not support the hypothesis that they are cholesteatomata. Neither have they any relationship to endotheliomata.

In the tumors in the authors' cases all of the structures normally associated with the skin except sweat glands and nails were present. Adamantine structures were not found although there was a close similarity between several of the small epithelial inclusions in the stratum durum and the tissue seen in certain cases of adamantinoma. These were found only in the tumor arising from the region of the temporo-sphenoidal suture and may have arisen from pharyngeal rests at the velum interpositum. The cerebellar tumor contained hair and hair follicles, which is unusual in dermoids, especially in those originating in the cranial cavity. This tumor contained also sebaceous glands and their ducts.

Davis, L.: Chiasmal Symptoms in Intracranial Tumors. *Arch. Ophth.*, 1931, vi, 181.

Davis reports 8 cases of intracranial tumor in which the diagnosis was based primarily on changes in the fundus of the eye or the visual fields. Five syndromes were presented: (1) homolateral optic atrophy, contralateral papilloedema, and anosmia; (2) bitemporal hemianopia and optic atrophy in a middle-aged person with a normal sella turcica; (3) unilateral exophthalmos and optic atrophy; (4) indefinite defects in the fields, optic atrophy, and rapid progressive loss of visual acuity; and (5) indefinite defects in the fields, papilloedema, and rapid progressive loss of visual acuity.

A normal condition of the sella turcica in a patient with bitemporal hemianopia and optic atrophy indicates that the lesion is different from the common expanding adenoma of the hypophysis. In 14 of the author's series of 252 cases of intracranial tumor the neoplasm belonged in the general group of chiasmal lesions. The operative mortality in these 14 cases was 14.2 per cent. Ten of the surviving patients have lived for periods ranging from nine months to ten years since the operation. Nine of the ten patients remain socially and economically independent.

ROBERT ZOLLINGER, M.D.

Subirana, A.: Tumors of the Posterior Fossa (Contribución al estudio de los tumores de la fosa cerebral posterior). *Rev. med. de Barcelona*, 1931, xiv, 512.

The diagnosis of tumors of the brain has been greatly improved by advances in certain specialties

such as ophthalmology, roentgenology, and ventriculography, and by increased knowledge of the physiology of the vestibule and changes in the cerebrospinal fluid. On the other hand, specialization is beginning to interfere with the broader general conception of brain tumors. Cushing and his school are advocates of neurosurgery, in which the physician is both neurologist and surgeon; he diagnoses the condition, performs the operation, studies the tissues histologically, and follows up the patient's history. Nevertheless the collaboration of the general practitioner is necessary for unless the early signs of brain tumor are detected the patient will not be sent to the specialist until it is too late for a successful operation.

In the diagnosis of tumors of the posterior fossa it has been the custom to rely on the cerebellar signs, but the author points out that these may occur in cases of tumors of other regions of the brain. He differentiates between cerebellar and vestibular symptoms and emphasizes the importance of Barré's sign of vestibular dysharmony in the diagnosis of tumors of the posterior fossa. In pure vestibular syndromes all of the signs are harmonious, that is, all of the slow deviations of the eyes, the head, and the trunk are in the same direction. If the signs are dysharmonious, that is, if the nystagmus is to the left and the deviation of the extended arms and trunk is to the right, involvement of the cerebellum and probably a tumor of the posterior fossa is indicated.

The author reports twelve illustrative cases. In two, the only symptom was vomiting and the condition was diagnosed and treated as appendicitis. In the diagnosis of tumors of the cerebellopontine angle Subirana has found the sign of vestibular dysharmony of great aid.

In children under fifteen years of age 70 per cent of brain tumors are subtentorial, that is, in the posterior fossa. After the age of fifteen years, supratentorial tumors increase in frequency. Between the fortieth and forty-fifth years only 18 per cent of brain tumors are cerebellar. After the age of fifty-five years there are practically no cerebellar tumors except those of the auditory nerve which are really extracerebellar although they are in the posterior fossa.

AUDREY GOSS MORGAN, M.D.

Roussy, G., Oberling, C., and Raileanu, C.: Neurospongionoma (Les neurospongiomes). *Presse méd.*, Par., 1937, xxxix, 977.

The neoplasms called by the authors "neurospongionoma" is the tumor designated by Bailey and Cushing as a "medulloblastoma." The authors describe it, give the history of its discovery, and review fifteen cases.

Neurospongionoma occur most frequently in young persons. Three of the authors' patients were under ten years of age, eight were between ten and twenty years old, and three were over twenty. The first symptoms were those of cranial hypertension—headaches of variable intensity with vomiting and diminution of visual acuity. To these disturbances

were soon added those of the cerebellar series, but it is not rare for disturbances of gait or vertigo to be present from the beginning. In some cases the cerebellar phenomena are slight or absent.

The tumors occur most often in the cerebellum. In ten of the authors' cases the neoplasm was in the vermis, and in five in one of the hemispheres. Extracerebellar localization is rare.

When the patient presents himself, the neoplasm is usually well developed and appears as soon as the dura mater is lifted. Extension of the neoplasm leads almost certainly to obstruction of the foramina of Luschka or the aqueduct of Sylvius and causes hydrocephalus. The tumor has a very marked tendency to invade the cerebral and spinal meninges. Propagation may occur in the interior of the ventricular cavities and lead to the formation of secondary nodules, true metastases, in the cerebral ventricles and in the spine, near the central canal. However, generalization never occurs outside of the nervous system. The neurospongionoma is the only type of cerebral tumor which propagates itself at a distance in the nervous centers. Because of its location and its invading characteristics it is not suitable for total surgical ablation. Attempts at extirpation are always followed by recurrence. Cushing, Bailey, and Vincent have obtained encouraging results from combined surgery and radiotherapy.

The abundance of neurofibrils and the large number of cells of a neuroblastic character warrant the conclusion that the majority of the tumoral cells belong to the neuroblastic group. However there are cellular elements which have only a slight affinity for silver and in form closely resemble spongionoblasts. The rôle of the latter in the formation of this variety of tumor does not seem to be established with certainty.

Neurospongionomata are formed from the neurospongionum and possess all the potentialities of development of the latter. Hence it may be assumed that they are of embryonic origin. In the cerebellar region dysembryoplasias are frequent. The occurrence of the tumors in young subjects and their frequent association with other neoplasms or malformations are additional points in favor of an embryonic origin.

Neurospongionomata have their homologues in other parts of the nervous system and in the domain of the sympathetic. These are the most malignant of the nerve tumors—true cancers of the nerve blastema.

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Van Wagenen, W. P.: A Surgical Approach for the Removal of Certain Pineal Tumors; Report of a Case. *Surg., Gynec. & Obst.*, 1931, liii, 216.

The author describes a surgical approach for the removal of certain tumors of the pineal gland which he used successfully in the case reported. He advocates controlling the pressure symptoms as long as possible by a right subtemporal decompression and intensive roentgen-ray or radium irradiation.

If these measures are not adequate, he believes an attempt at extirpation of the tumor through the dilated right lateral ventricle is justifiable.

His patient, a woman of thirty-four years, complained of headache, failing vision, and bilateral tinnitus. A right subtemporal decompression had been performed in another hospital several months before the patient's admission to Van Wagenen's service, and seven deep roentgen-ray treatments had been given. Ventriculograms had twice shown a mass projecting into the shadow of the air-filled third ventricle. Both of the lateral ventricles and the third ventricle were dilated. About eight months after the decompression, a right parieto-occipital bone flap was turned down. The ventricles were tapped daily to relieve the symptoms of intracranial pressure. A week later the wound was re-opened. A reversed L-shaped incision from 6 to 7 cm. long was made in the cortex, extending from the posterior end of the superior temporal lobe gyrus upward and slightly backward to the lobulus parietalis superioris. The incision was carried downward into the ventricle with the aid of the electrocautery without difficulty. Wet cotton pledgets were placed over the exposed choroid plexus and in the opening of the ventricles to keep out blood and tumor debris. The author believes that the choroid plexus should not be covered with cotton as considerable bleeding followed removal of the cotton at the end of the operation. The thin medial wall of the lateral ventricle was incised with the electrocautery and the third ventricle was opened anterior to the tumor. The tumor, which was about 3 cm. in diameter, lay between and above the large dilated vena vorticosae. At its base it was adherent to the tributaries of the vein of Galen. Practically all of the tumor except a small bit adherent to large veins was removed.

For from twenty-four to thirty-six hours after the operation the patient had a Biot type of respiration and weakness of the left side. About forty-eight hours after the operation she became comatose. The wound was then opened and a drain inserted into the incision in the cortex. Thereafter her condition improved rapidly. Blood-tinged cerebrospinal fluid and a small amount of tissue debris were removed. The weakness on the left side cleared up and the strength of the two sides is now normal. A left homonymous hemianopsia has persisted. There is a slight hypoesthesia to pinprick over the left side and at times an astereognosis on the left for test objects. Fifteen months after the operation she was able to do a good part of the housework for a family of six persons.

The neoplasm proved to be a spongioblastic type of tumor of the pineal gland. ROBERT ZOLLINGER, M.D.

Rawling, L. B.: A Contribution to the Surgery of the Pituitary Region. An Account of Four Cases of Pituitary Tumor Treated with Radon Seeds. *Brit. J. Surg.*, 1931, ix, 68.

In the four cases reported a frontal bone flap was formed, a tiny slit made in the dura at the base of

the anterior clinoid processes, a grooved director passed through the slit down to the base of the pituitary fossa, and radon seeds then inserted by means of the seed introducer. As proved by X-ray and postmortem examination, implantation of radon seeds into the tumor substance can be done with fair accuracy by this method.

The first and fourth patients were adults. The author believes their tumors were undoubtedly pituitary adenomata although this was not proved by biopsy. The second and third patients were children with congenital suprasellar tumors. The first patient showed improvement for nine months after the treatment and then died suddenly. The second and third patients died without showing improvement, one shortly after, and the other about a year, after the treatment. The fourth patient is alive and doing well more than a year after the operation.

Rawlings concludes that the effect of radon corresponds to that of deep X-ray therapy, being favorable upon adenomata and unfavorable upon epithelial tumors. LEO M. DAVIDOFF, M.D.

Argañaraz, R.: Suprasellar (Intracranial) and Orbital Meningiomas (Meningiomas supracelares (intracraniales) y orbitarios). *Semana med.*, 1931, xxxviii, 1409.

The chief signs of tumors of the hypophysis are the results of functional disturbances of the gland, such as infantilism and acromegaly. In cases of meningioma the first manifestations are disturbances of vision; hypophyseal disturbances do not develop until the tumor has reached a considerable size. It is of the greatest importance to make the diagnosis of meningioma from the ophthalmological signs as the prognosis of operation is best in the early stages. The ophthalmologist should always think of meningioma when a person over forty years of age presents a so-called unilateral retrobulbar neuritis and particularly when he shows a beginning optic atrophy.

A meningioma may develop anywhere along the optic tract, either within the orbit or outside of the orbit and within the skull cavity. The symptoms vary according to the site of the tumor. As a rule suprasellar meningiomas do not cause a periosteal reaction such as is produced by meningiomas at other sites at the base of the brain. Disturbances of vision develop before disturbances of the visual field. It has been said that the hemianopsia in cases of meningioma is always in the upper quadrant, but this is not necessarily true; it depends on the site of the tumor. Meningiomas sometimes develop just at the optic foramen, partly inside and partly outside of the orbit. The author reports a case in which only the intra-orbital part of the tumor was removed. He says that measurement of color vision does not yield characteristic signs, but Cushing holds that it does. Different forms of retrobulbar neuritis—the rhinogenous forms, for example—produce the same symptoms.

Meningiomas of the intra-orbital part of the optic nerve are generally seen in children or ado-

lescents, while suprasellar meningioma generally occur in persons between forty and fifty years of age. The ophthalmologist has a better chance than the neurologist of diagnosing these tumors in the early operative stage as the eye symptoms appear first.

Six typical cases are reported.

AUDREY GOSS MORGAN, M.D.

PERIPHERAL NERVES

Stewart, F. W., and Copeland, M. M.: Neurogenic Sarcoma. *Am. J. Cancer*, 1931, xv, 1235.

The authors have found that a large percentage of sarcomata of the soft parts are of neurogenic origin and possess the same gross, microscopic, and clinical features as similar tumors in patients with one or more manifestations of von Recklinghausen's disease. They may or may not show a definite anatomical connection. The authors believe that neurofibromata, plexiform or circoid neuromata, ganglionic neuromata, solitary neurogenic sarcomata, elephantiasis neuromatosa, nerve naevi, and melanomata are closely related clinical pathological groups. They have frequently found extraperiosteal fibrosarcomata to be of neurogenic origin and associated with stigmata of neurofibromatosis. They believe that the cell of origin of these tumors is the Schwann cell and that the lamellar sheath contributes elements to some of the tumors. They describe a group of tumors in which the cell structure was epithelioid. They believe these tumors may bridge the gap between typical neurosarcoma and typical melanoma.

Neurogenic sarcomata may occur anywhere, but the authors have noted a tendency of these tumors to involve certain nerve groups. The sites of occurrence of the primary tumor are, in order of decreasing frequency, the vicinity of the knee, the groin, the upper anterior part of the hip, the upper arm, the gluteal region, the upper posterior part of the thigh, the scapular and interscapular regions, the upper forearm, and the region of the brachial plexus. Where nerve connections were demonstrated by dissection, the nerves affected, in decreasing order of involvement, were the ulnar, median, radial, sciatic, femoral, anterior crural, and popliteal nerves, the lumbosacral plexus, the cervical sympathetic nerves, and the peripheral nerves in the scapular region.

The authors review forty-three cases. In the majority solitary tumors occurred between the ages of twenty and fifty years. The incidence of the types occurring in von Recklinghausen's disease showed two peaks, one between the first and tenth years and the other between the thirtieth and fiftieth years.

The tumors were graded according to the plan of Quick and Cutler. Those of Grade 1 were the relatively acellular, fibrous tumors composed of spindle cells lying in dense hyaline fibrous tissue and tumors with very extensive mucinous degeneration which were practically devoid of cells. Those of Grade 2 were more cellular tumors composed of interlacing whorls of hyperchromatic spindle cells with less intercellular substance and occasional giant cells.

Those of Grade 3 were very cellular tumors with small spindle or polyhedral cells, closely packed or larger polyhedral and atypical giant cells, and occasional telangiectatic features. The authors consider grading of the tumors of great importance in the determination of the prognosis as well as the type of treatment. A tumor of slow growth and long duration does not necessarily show a low-grade structure.

After excision, recurrence is the rule. In the cases reviewed the recurrences were not recurrences in the ordinary sense, but new tumors arising from nerves in the vicinity. Definite evidence that irradiation after excision prevents or delays recurrence was lacking, although the regression of certain tumors for five years suggested that this was at least probable. As certain tumors recurred during the course of irradiation, it may be advisable, in the treatment of less cellular tumors, to delay irradiation until there is evidence of recurrence in order to avoid exhausting the skin tolerance. In the cases reviewed the best results were obtained in the more malignant types of tumors. In certain cases of quiescent or slowly growing neoplasms of long duration operation was followed by recurrence and the patient's condition was made worse by the treatment. It is suggested that in cases of this type a policy of non-interference should be adopted. No patient with neurogenic sarcoma of Grades 2 or 3 lived for five years without disease and without treatment during the five-year interval unless he was treated by amputation.

The article contains numerous photographs and photomicrographs of the tumors in the cases reviewed.

ROBERT ZOLLINGER, M.D.

SYMPATHETIC NERVES

Yater, W. M., and Trehwella, A. P.: The Case For and Against the Operative Treatment of Angina Pectoris. *Am. J. M. Sc.*, 1931, clxxxii, 35.

The authors report the case of a man fifty-five years of age who was subjected to a left superior cervical ganglionectomy for angina pectoris. While the operation was followed by relief at first, pain in the jaw, shoulders, and arms and paræsthesia of the chest wall as disagreeable as the original pain developed subsequently.

Of 138 patients similarly treated by 44 surgeons, about 40.5 per cent were relieved of their original pain, 6.5 per cent died as a result of the operation, 22 per cent were relieved only partially or not at all, and 31 per cent were made worse. The authors conclude that paravertebral block with alcohol is a much safer and more logical procedure.

LEO M. DAVIDOFF, M.D.

Hesse, E.: Lumbosacral Sympathetic Ramisection (Ramicotomia lumbosacralis sympathica). *Verhandl. d. 21 russ. Chir.-Kongr.*, Leningrad, 1930, p. 219.

The author discusses the indications for lumbosacral sympathectomy and reports 18 cases without a death. Urinary retention of two days' duration occurred in 1 case and lumbosacral neuralgia devel-

oped in another. For the unilateral operation the Stahl-Wertheimer-Bonniot anterior extraperitoneal approach was preferred, but for the bilateral operation the transperitoneal method was used. The aim was to divide only the individual rami communicantes. The results were vascular dilatation, acute hyperemia, considerable improvement in the circulation with a very marked rise of temperature in the skin, anhydrosis, disappearance of the pilomotor reflexes of the lower extremities and of the muscle tonus, and a large number of trophic neurotic changes manifested by pain and edema. In some cases healing of trophic ulcers occurred.

In a case of resistant amputation neuralgia Hesse used this operation without success. Chordotomy done at another time was also unsuccessful. In vasomotor changes and Raynaud's disease, Hesse obtained a good result.

In the cases of otherwise healthy women from eighteen to twenty-six years of age who present vasomotor changes, cyanosis, and marked local hypothermia of the lower extremities, the operation is contra-indicated and ovariin should be given. Of 5 cases of spontaneous gangrene, very good results were obtained in four, in 3, the pulse re-appeared in the arteries of the foot. Of a total of 30 cases of spontaneous gangrene which have been reported, positive results were obtained in 19. In cases of obliteration of the arteries the operation is useless. In this condition the intravenous protein test pro-

posed by Brown, with which the dilatability of the blood vessels can be determined, is of great value. If after the intravenous administration of protein (a vaccine, for example) the temperature of the skin is not raised or is increased no more than 0.5 degree, no result can be expected from lumbosacral sympathectomy. In 2 cases of senile gangrene and in cases of varicose ulcer in which a previous total extirpation of the varicose veins and the neurotomy of Molotkov were unsuccessful lumbosacral sympathectomy gave no result. The varicose ulcers healed for a short time, only to recur.

Of 9 cases of spastic paralysis, a good result was obtained in 5, slight improvement in 2, and no improvement in 2 (parkinsonism). In muscular hypertonia and spastic paralysis of the lower extremities the operation gave considerably better results than in involvement of the upper extremities. This fact may be explained by the less differentiated and more primitive function of the lower extremities. One hundred and twenty-four cases of sympathectomy for spastic paralysis were found in the literature. If the disease is too protracted, if the cortical centers are destroyed, if the primary process has not subsided completely, if psychic disturbances (imbecility), are present, and if there is no adequate control on the part of the cerebral cortex, the operation is useless, but when the proper indications are present it may be of value.

J. KORNMAN (Z).

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Bertrand, I., and De Nagy, A.: Research on Some Tests Concerning the Histological Prognosis of Cancers of the Breast (Recherches sur quelques tests concernant le pronostic histologique des cancers du sein). *Presse méd.*, Par., 1931, xxxix, 991.

The authors studied the muco-albuminous secretory function of cancers of the breast, which Delbet and Mendaro characterize as a "gauge of benignity," and also the cells with argentaffine granulations, the significance and pathogenesis of which are still obscure. Their purpose was to determine the importance of these factors in the prognosis of cancer of the breast.

The anatomical material consisted of sixty-eight breast cancers operated upon on Gosset's service during the year 1922. The study was made in 1927. The histological techniques included the use of: (1) hematin-eosin-saffron, (2) Masson's trichrome process, (3) mucicarmine of Mayer-hemalum-metanilin yellow, (4) impregnation of pigments by Fontana's ammoniacal silver nitrate and staining of the background and of the nuclei with magenta and picro-indigocarmine according to Masson's formula, and (5) orcein-hemalum-eosin-saffron (Rubens-Duval formula).

In cases of epithelioma of the breast mucus is not very abundant. It is present in very limited segments of the neoplasm. As a rule the formation of mucus seems to be only a morphological accident. It is only in a restricted sense that one may speak of a mucosecretory cancer. Of the sixty-eight cancers studied, twenty-eight (41 per cent) secreted mucus. According to their histological structure the latter may be classified into the following three groups:

1. Typical cancers considered classically and *a priori* as of moderate malignancy. Fourteen of the cancers were of this type. Among them were found polyadenomatous epitheliomata, pseudo-acinous forms, kidney-shaped tumors with rosettes (Delbet), and epithelioma with clear cells. Axillary metastases were present in 72 per cent of the cases.

2. Cancers which, in spite of the secretion of mucus, were histologically malignant. Three of the neoplasms were of this type. The mucus was not abundant and was generally in the form of cellular inclusions. Metastases were present in all of the cases.

3. Polymorphous epitheliomata with typical and atypical appearances. Eleven of the neoplasms were of this type. Frequently there was an abundant secretion of mucus in contact with interstitial tissue. These colloid or endocrine-secreting forms were observed seven times. In this group the incidence of metastasis was 88 per cent.

Taken together, 82 per cent of the secreting cancers showed glandular and axillary invasion. In forty non-secreting cancers the incidence of glandular metastasis was 62 per cent.

Of fifteen patients followed, eight survived and seven died. At the time of the follow-up, those surviving were in excellent health. Those who died succumbed to recurrences or metastases. Mucus was found in eight (53 per cent) of the fifteen cancers. It was present in four (50 per cent) of the eight cases of survival and in four (57 per cent) of those which were fatal. From these figures it would appear that the presence or absence of mucus in an epithelioma is not a factor in the postoperative prognosis. Of the cases of survival, the axillary glands were invaded in only 57 per cent, whereas of the fatal cases, they were invaded in 83 per cent. The condition of the glands is therefore of importance in the postoperative prognosis.

Of the sixty-seven cancers, twenty-five (37 per cent) contained argentaffine elements. Most argentaffine cells are of mesenchymatous origin.

Among the sixty-seven cancers there was not a single true argentaffine secreting epithelioma.

In cases of invasion of the skin by epitheliomatous tracts there was an extraordinary multiplication of the Langerhans cells. In the deep layers of the epidermis, very ramified pigmentary elements resembling mesenchymatous chromatocytes in form were found. This phenomenon shows that the epidermal invasion is preceded by a very active pigmentary alteration in the deep epithelial layers, and that the multiplied elements of Langerhans play an important rôle in the process.

Of ten cases of survival in which operation was performed, argentaffine cells were found in four (40 per cent). Of the six patients succumbing from recurrences or metastases, these cells were found in two (33 per cent). It therefore appears that the argentaffine elements are the index of an active and abnormal metabolism, but that their presence or absence does not establish the remote postoperative prognosis.

PAGE.

Cutler, M.: The Treatment of Mammary Carcinoma by Means of Removable Radium Needles. *Surg., Gynec. & Obst.*, 1937, lxxvii, 71.

Cutler deals chiefly with the treatment of inoperable carcinoma of the breast by interstitial irradiation.

Several important difficulties are encountered in the irradiation of mammary carcinoma. As carcinoma may be present in areas of the breast and areas of lymphatic drainage that appear normal on clinical examination, it is imperative, in planning the treatment, to regard all of these areas as invaded

by the disease. When the breast is large and fat, the geometrical conditions are most unfavorable and the delivery of an intense and uniform dose of irradiation by surface application is especially difficult. The anatomical relations of the axillary lymphatic glands render it almost impossible to deliver an adequate and uniform dose to these structures without injuring the skin and the important axillary vessels and nerves.

Cutler is of the opinion that carcinomata of the breast exhibit notable variations in radiosensitivity, and that because of the limitations in the effect of external irradiation on mammary cancer it is usually necessary to resort to interstitial irradiation to deliver a lethal dose to the tumor cells. Interstitial irradiation is most efficacious in small, accessible tumors. The most important obstacle to the successful treatment of mammary carcinoma by irradiation is the difficulty of delivering adequate, uniform, and homogeneous irradiation to the axilla. Cutler describes his technique in detail and reports two cases. From his experience he draws the following conclusions:

1. Interstitial irradiation is the method of choice in the treatment of inoperable carcinoma of the breast
2. Long radium needles that are removable permit more uniform irradiation than can be obtained with radon seeds
3. Adequate filtration is essential.
4. The irradiation of mammary carcinoma must follow the same principles as radical operation for the disease
5. The peripheral edge of a tumor requires the most intense irradiation
6. The healing of ulcerated lesions of the breast can be accomplished and impending ulceration prevented by the technique of irradiation presented in this article but no claim can be made for the permanency of the results
7. Peripheral irradiation can cause regression of advanced mammary carcinoma

EMIL C. ROBITSNEK, M.D.

TRACHEA, LUNGS, AND PLEURA

Van Allen, C. M., and Lindskog, G. E.: Collateral Respiration in the Lung: Its Role in Bronchial Obstruction to Prevent Atelectasis and to Restore Patency. *Surg. Gynec. & Obst.*, 1931, lxxi, 16

From experiments on animals which they describe in detail the authors draw the following conclusions:

1. The branches of the bronchial tree in a single lobe of the lung intercommunicate at the periphery in such a manner as to permit the transfer from one to the other of gases, fluids, and particulate matter. The process of transfer is referable both to diffusion and to passage through minute openings. The airways of two neighboring lobes do not so communicate.

2. A lobule of lung with a centrally obstructed bronchus may breathe satisfactorily by using the peripheral interconnections with adjacent free lobules.

3. Collateral respiration plays two economic rôles in the lobular form of bronchial obstruction, namely, that of preventing the development of atelectasis and that of rendering important assistance to the broncho-eliminative forces.

4. Collateral respiration may be excluded by closure of the airways along the margins of the obstructed lobule which have to do with the intercommunication. This may result from blockage with secretions or other materials or from shut-down during periods of shallow breathing. The latter circumstance is probably a factor in postoperative atelectasis.

EMIL C. ROBITSNEK, M.D.

Kirklin, B. R., and Hefke, H. W.: Actinomycosis of the Lungs. *Am. J. Surg.*, 1931, lxxi, 1.

Pulmonary and pleural invasion often follows abdominal actinomycosis.

After reviewing the literature, the authors describe the roentgenological manifestations in fourteen cases of thoracic actinomycosis observed at the Mayo Clinic. All of the cases were proved by the demonstration of actinomycetes in the sputum, in the discharge from the sinuses, or in the contents of empyema cavities. In eight cases combined pleural and pulmonary changes were observed. These consisted of enlargement of the hilum, infiltrative strands radiating into the lung from the hilum, localized consolidations in one or more lobes, pleural thickening, dense pleuritic adhesions, or fluid in the pleura. The manifestations were wholly pleural in four cases and wholly pulmonary in one case. In five cases the pulmonary and pleural adhesions were associated with areas of destruction in portions of the ribs or sternum, with or without osteomyelitis and periostitis. This combination is the sole roentgenological syndrome which is more or less diagnostic of actinomycosis. Careful roentgenological examination of the thorax in all known cases of actinomycosis, particularly of the abdominal organs, would probably lead to the earlier discovery of thoracic involvement and to better therapeutic results.

Felix, W.: Packing in the Surgical Treatment of Pulmonary Tuberculosis (Ueber die Plombierung in der chirurgischen Behandlung der Lungentuberculose). *Ztschr. f. Tuberk.*, 1931, lxx, 385.

This article is based on the extensive experience of the Sauerbruch Clinic with packing treatment for pulmonary tuberculosis. It is pointed out that in the last ten years there have been no statistics on extrapleural packing for pulmonary tuberculosis which are based on more than 100 cases. The wide experience of the Sauerbruch Clinic proves that, when indicated, the method is often very beneficial.

The author discusses the possible complications. Disturbances of the healing-in of the foreign

material are manifested by exudate formation resulting from aseptic foreign body inflammation or infection of the packing bed. When there is complete sepsis, infection may occur only from foci within the lung by way of the lymph tracts or from perforation of a cavity wall. According to the experience of the Sauerbruch Clinic with infection of the packing bed, the pack should be removed as late as possible but not at all, but when there is perforation of a cavity the foreign body cannot be removed too quickly. Cavity-wall perforation is differentiated clinically from lymphogenous infection of the packing-bed by stormier inflammatory phenomena and the development of emphysema in the region of the pack. Compared with acute cavity perforation, late perforation of a cavity wall is considerably less dangerous and does not demand immediate surgical intervention. In cases in which the weight of the pack causes mechanical disturbances, removal of the pack is urgent whenever the pressure is exerted upon portions of the right heart wall, especially the right auricle, and causes serious disturbances in cardiac rhythm. The danger from aspiration is much less in packing therapy than in more extensive collapse procedures. Occasionally, however, rigid cavity walls do not yield to the packing pressure and compression of the efferent bronchus of the cavity may lead to retention of secretion and its undesirable sequelae.

Proper indications are of primary importance. When pneumothorax succeeds and when thoracoplasty promises success, the pack is contra-indicated. When there is a partial pneumothorax over the lower lobe, paraffine packing over the upper lobe should be avoided because of the danger that the paraffine may sink into the pneumothorax. A paraffine pack may very advantageously supplement an incomplete thoracoplastic collapse of a cavity. The chief indication for the pack is a large cavity in the upper lobe. The increase during the last few years of reports of the healing of cavities following simple artificial paralysis of the diaphragm makes greater clarity imperative as to the cases in which phrenico-exeresis will be successful in order that unnecessary packing may be avoided. In spite of numerous failures, the author believes that packing merits wider development. More careful determination of the indications and improvement of the technique and material are of primary importance.

GRAT (Z).

Gale, J. W., and Middleton, W. S.: Scalenotomy in the Surgical Treatment of Pulmonary Tuberculosis. *Arch. Surg.*, 1931, xxiii, 38.

From experimental and clinical evidence the authors conclude that the scaleni muscles have an important relation to the respiratory activity of the upper part of the thorax.

Scalenotomy together with phrenic nerve block performed on seven tuberculous patients resulted in satisfactory immobilization of the involved pulmonary apex.

This combined operation is easy and simple and may be valuable as a conservative procedure preceding more radical operations.

J. DANIEL WILLEMS, M.D.

Bettman, R. B., and Biesenthal, M.: Thoracoplasty in the Presence of Artificial Pneumothorax. *Am. Rev. Tuberc.*, 1931, xxiv, 95.

In cases in which artificial pneumothorax has been induced for some time before operation the absorption of the pleural air may be slow. In cases of artificial pneumothorax coming to operation for extrapleural thoracoplasty the presence of intrapleural air is undesirable because the immediate collapse of the chest following the operation may raise the intrapleural pressure to such an extent that severe cardiac and respiratory embarrassment may ensue or because, especially when the mediastinum is fixed, the intrapleural air may prevent satisfactory collapse of the chest wall. It is therefore desirable to reduce the intrapleural air in an amount approximately equivalent to the reduction occurring in the size of the chest cavity following costatectomies. This is best done at the time of the operation. A simple method is described.

Bettman, R. B., and Biesenthal, M.: Extrapleural Thoracoplasty Performed under Spinal Anæsthesia. *Am. J. Surg.*, 1931, xi, p. 469.

The authors report ten cases of extrapleural thoracoplasty performed under spinal anaesthesia induced by injecting into the usual lumbar site a solution made by dissolving from 200 to 250 mgm. of novocain crystals in from 6 to 8 c.cm. of the patient's spinal fluid. In one case the anaesthesia in the upper part of the chest was not satisfactory and the use of ethylene was necessary for operation on the upper three ribs, but in the last six cases the spinal anaesthesia was satisfactory for the upper stage as well as the lower stage of the operation.

The authors recommend the use of spinal anaesthesia in selected cases of pulmonary tuberculosis requiring extrapleural thoracoplasty.

Ochsner, A., and Gage, I. M.: Acute Empyema. *Thoracis. Ann. Surg.*, 1931, xxiv, 25.

The study is based on 124 patients admitted to the Charity Hospital, New Orleans, of which number 64.4 per cent were white, 35.4 per cent were colored, 76.2 per cent were males, and 21 per cent were females. The majority were between the ages of eleven and twenty years and 78.9 per cent were in the second, third, and fourth decades of life. The mortality was highest after the fiftieth year of age.

The empyema was due to lobar pneumonia in 61.9 per cent of the cases, influenza in 18.1 per cent, tuberculosis in 12.8 per cent, and lung abscess in 5.5 per cent. Tuberculosis was the underlying lesion in 19.7 per cent of the colored patients and 8.7 per cent of the white patients.

The signs and symptoms in order of decreasing frequency were dullness on percussion, pain, cough,

limitation of thoracic movement, absence of breath sounds, expectoration, and cardiac displacement.

In the cases of the colored patients the mortality was higher (33.3 per cent) when the process was on the left side than when it was on the right side (5 per cent), whereas in the cases of white patients it was higher in cases of empyema on the right side (13.16 per cent) than in those of empyema on the left side (3.9 per cent).

The empyema was of the metapneumonic variety in 60.3 per cent of the cases, of the synpneumonic type in 21.6 per cent, tuberculous in 12.6 per cent, and staphylococcal in 5.4 per cent. Improvement and recovery occurred in 92.2 per cent of the metapneumonic cases, 75 per cent of the synpneumonic cases, and all of the staphylococcal cases.

The pleural fluid was purulent in 79.03 per cent of the cases (mortality 7.3 per cent), serous in 3.98 per cent (mortality 20 per cent), and hæmorrhagic in 4.83 per cent (mortality 100 per cent).

Aspiration alone was used in 8.8 per cent of the cases, aspiration plus the injection of air in 21.5 per cent, intercostal drainage in 30.3 per cent, and rib resection in 39.2 per cent. Aspiration alone resulted in improvement or recovery in 41.7 per cent of the cases in which it was employed, and aspiration plus air injection resulted in improvement or recovery in 79.2 per cent. The mortality in cases treated by aspiration was 10.3 per cent. Intercostal drainage resulted in improvement in 80.5 per cent, recovery in 7.3 per cent, and death in 12.2 per cent. Rib resection was followed by improvement in 79.2 per cent, recovery in 5.2 per cent, and death in 13.2 per cent. The mortality was lowest in the cases treated by aspiration of the pleural contents combined with the injection of air. Open drainage was employed in 45.2 per cent of the cases. Of the patients so treated, 14.5 per cent died and 83.2 per cent were benefited or recovered. The mortality of negroes following open drainage was 26.3 per cent, whereas that of white patients was 6.9 per cent. Closed drainage was used in 54.2 per cent of the cases. Of the patients so treated, 12.2 per cent died and 87.7 per cent were benefited or recovered. Complications developed in 5.8 per cent of the cases. Of the complications, 62.5 per cent occurred in white patients. The most common unfavorable sequela, representing 21.8 per cent of all complications, was acute nephritis. Bronchial fistula and abscess of the chest wall constituted 15.6 and 9.3 per cent of the complications.

The mortality in the entire number of cases was 15.3 per cent. Among the white patients it was 10 per cent and among the negro patients 25 per cent. Of the entire number of patients, 82.2 per cent were benefited or recovered completely.

Ratti, A.: Roentgen Characteristics of Pleural Effusions Secondary to Tumor (Sui caratteri radiologici dei versamenti pleurici secondari a tumori). *Radiol. med.*, 1931, xviii, 1027.

Primary tumors of the pleura are very rare, but secondary tumors are quite common. Pleural tumors

are generally manifested clinically and roentgenologically by a liquid effusion. The author reports a study carried out to determine whether it is possible to differentiate between inflammatory effusion and effusion from tumor by roentgen examination. He describes his findings in twenty-six cases of pleural effusion from tumors of different types in different locations and includes in his article a number of roentgenograms.

The most common tumor was cancer of the breast. In cases of this type of neoplasm and in most of those of tumors of other types a definite differentiation between inflammatory effusion and tumor effusion was impossible. In cases of tumor of the mediastinum, however, the effusion was rather characteristic; it seemed to accumulate at the cardiophrenic angle and extend downward toward the lateral wall of the thorax. Ratti concludes that this characteristic may be of some aid in the differential diagnosis. A comparison of the roentgenograms and the pathologico-anatomical findings showed that even a slight liquid effusion on one side in the picture may correspond to an extensive and diffuse lesion of the pleura on both sides. AUDREY GOSS MORGAN, M.D.

ESOPHAGUS AND MEDIASTINUM

Kelly, A. B.: Congenital Abnormalities At or Near the Upper End of the Esophagus. *Proc. Roy. Soc. Med., Lond.*, 1931, xxiv, 1198.

Atresia of the esophagus with an esophago-tracheal fistula invariably has a fatal outcome which usually occurs after four or five days. The upper part of the esophagus ends blindly above the level of the bifurcation of the trachea. The lower part opens as a fistula into the trachea or, rarely, into a bronchus. When attempts are made to introduce fluids, the child chokes and becomes cyanotic and is unable to swallow. Vomiting of meconium may occur, and large amounts of air may be present in the stomach. The abnormality may be demonstrated by roentgen examination after the introduction of barium.

In cases of congenital stenosis there may be a history of dysphagia and regurgitation from birth or from the time when solid food was first taken.

Stenosis opposite the seventh thoracic vertebra is revealed in the roentgenogram as a constriction corresponding to the hiatal esophagus and cardia. Therefore it is possible that the viscus between the stenosis and the diaphragm is a part of the stomach which is located in the thorax because of congenital shortness of the esophagus.

Stenosis at the upper end of the esophagus is usually first found by the pathologist.

Simple stenosis at the entrance to the esophagus may be a simple diminution in the size of the lumen or a membranous diaphragm, fold, or ledge.

Congenital stenoses at or near the upper end of the esophagus are rare. The author reviews the literature on such stenoses and discusses several cases he has seen. J. DANIEL WILLEMS, M.D.

Peterson, D. R.: Obstruction at the Upper End of the Oesophagus. *Proc. Roy. Soc. Med., Lond.*, 1931, xxiv, 1205.

Spasm at the entrance of the oesophagus is a clinical syndrome in women, the essential feature of which is a gradually increasing dysphagia associated with atrophic changes in the buccal and pharyngeal mucus. At a later stage there is anemia and often splenomegaly. The process usually begins in middle life and progresses rapidly. The hypopharynx acquires a marked rigidity, while the sphincteric opening may be reduced to the size of a pinhole or a slit. The passage of a tube gives relief, but permanent cures are not frequent.

Malignant disease of the upper end of the oesophagus is more common in women than in men and may occur before the thirtieth year of age. It is characterized by dysphagia and often by pain which frequently is localized on one side or is felt in one ear. The results of treatment of malignancy in this region are dependent upon the time at which the condition is detected. For early diagnosis the laryngoscope, oesophagoscope, and X ray are essential.

Postcricoid webs are thin bands in the region of the oesophageal orifice. They vary greatly in size. They are easily detected and may be removed by the passage of a tube. J. DANIEL WILLIAMS, M. D.

Sharp, G. S.: Leucoplakia of the Oesophagus. *Am. J. Cancer*, 1931, xv, 2029.

Leucoplakia of the oesophagus, although commonly found at autopsy, rarely receives clinical recognition. The oesophagus is the narrowest and one of the most muscular of the alimentary tubes and is subjected to about the same irritants as the mouth. The available evidence favors the hypothesis that the most important of the known causes of both oral and oesophageal leucoplakia is chronic irritation such as may be produced by hot liquids and hot foods. Among the local factors, oral sepsis is probably the most important.

Like carcinoma, leucoplakia occurs most frequently in the lower third of the oesophagus. This fact has led to much speculation as to the relationship between the two conditions. In leucoplakia, thickening of the epithelium is of less importance than the increase in the number of cells.

Leucoplakia of the oesophagus is of three grades. Leucoplakia of the first grade, which is the most common, is characterized by a diffuse patchy film with thickening of the epithelial layer and an increase in the number of epithelial cells but no changes in the basal layer. Leucoplakia of Grade 2 shows flat mucosal warts or plaques with many mitotic figures, an elongation of the corium papillar, and an increase in subepithelial infiltration. It is usually found in the lower third of the oesophagus. The leucoplakia of Grade 3 is characterized by elevated, opaque, whitish plaques of irregular size and shape, a varying degree of induration, and further proliferation of the epithelium toward the sur-

face in pile-like formation and toward the deeper layers by an extension downward of the tunica propria, which frequently invades the muscularis. All three degrees of leucoplakia may be present in the same organ.

Bucher stated that if leucoplakia were a pre-cancerous lesion it would be found with cancer more frequently. Recently Schaer has demonstrated leucoplakia in all of his cases of oesophageal carcinoma. In no instance, however, was it of Grade 3. Leucoplakia of Grade 2 was found in eight of twelve cases and leucoplakia of Grade 1 in the remaining five. The author believes that leucoplakia is often followed by carcinoma.

Leucoplakia of the oesophagus is now recognized more frequently because of the increasing use of the oesophagoscope. Its similarity to leucoplakia of the oral cavity suggests that the prognosis should be guarded, especially when the condition is advanced.

L. CARL O. LUTIMER, M.D.

Margolis, H. M.: Tumors of the Thymus: Pathology, Classification, and Report of Cases. *Am. J. Cancer*, 1931, xv, 2106.

Primary neoplasms may arise either from the parenchyma or the stroma of the thymus. Two diametrically opposed views are held as to the origin of the small thymic cells of the parenchyma. Maximow believed these cells to be related to blood cells, while according to Jaffe they arise from endodermal thymic reticulum. Until a conclusion is reached as to their origin, a classification of thymic tumors is unwarranted. Any classification of tumors arising from the thymic parenchyma should imply clearly the lack of definite knowledge regarding their source. Grandhomme's term "thymoma" is therefore justified.

Although it is impossible to conclude with certainty regarding the histogenetic source of all thymomata, a unity of origin of all parenchymatous tumors of the thymus from one embryologically distinct source, the endodermal component of the thymus, is suggested. The small cortical cells are probably of endodermal origin and are a morphological variation of the parent cells. There is considerable evidence that morphological variation among cells can be induced by the environment of the cells. Epithelial cells have been shown to undergo transformation into spindle shaped cells when they are grown in certain media, and may assume a rounded appearance when they are grown in a medium of different consistency. Such observations indicate that little reliance can be placed on morphological criteria alone in the recognition and differentiation of neoplasms. This becomes increasingly evident in the more malignant types of sarcoma, in which the lack of differentiation of the cells consequent to their rapid growth almost precludes the possibility of constant identification from histological examination of the tissue alone.

For the present, the designation "sarcoma," including lymphosarcoma, of the thymus, should be

reserved for tumors apparently derived from the elements within the stroma of the thymus.

EARL O. LATIMER, M.D.

Bosanquet, W. C., and Lloyd, W. E.: A Malignant Tumor of the Thymus Gland. *Lancet*, 1937, CCXVI, 6.

The patient whose case is reported was a woman twenty years old. Her earliest symptoms were dyspnoea, a cough, and loss of weight. At night she frequently had "choking" attacks which were attributed to asthma. She first came to the hospital for examination because pulmonary tuberculosis was suspected. Examination revealed considerable retraction of the chest wall, particularly over the apices of the lungs. The roentgenogram showed some enlargement of the heart and an apparent displacement of the trachea to the right with narrowing of its lumen. No tubercle bacilli were found in the sputum. The patient was sent to a sanatorium, where she remained a month. During that time she gained 6 lb., but her general condition did not improve appreciably. Re-examination showed the larynx to be essentially negative. The thyroid gland was thought to be enlarged, but this could not be determined with certainty even after exploration through an incision over the gland. The patient's condition grew worse. The chest became extremely flattened. The slightest exertion caused marked dyspnoea, and death occurred suddenly during a severe attack of dyspnoea.

At autopsy the right lobe of the thyroid gland was found to be considerably enlarged. Below the thyroid, but not continuous with it, there was a large mass which compressed the trachea and surrounded the left carotid sheath. The lungs were for the most part indurated and airless. No secondary

metastases of the tumor were discovered. The tumor was found to be a hæmangio-endothelioma derived from the vascular endothelium of the thymus gland. As it was apparently not composed of thymic elements, it was a tumor in, rather than of, the thymus gland.

Bosanquet and Lloyd discuss the incidence of tumors of the thymus as reported in the literature. Of forty-three reported tumors, twenty-nine were carcinomata and fourteen were sarcomata. Of the twenty-nine carcinomata, twelve were apparently lympho-epitheliomata, thirteen were described simply as carcinomata, and four were epitheliomata. Of the fourteen sarcomata, ten were lymphosarcomata. The pathological classification of these tumors has been unsatisfactory and indefinite.

The most constant sign of tumor of the thymus gland is dyspnoea. Cyanosis is also frequent, and pleurisy with effusion is not uncommon. Secondary metastases may give rise to symptoms remote from the thymus gland. The X-ray may aid in the diagnosis. In the case reported it seemed difficult to account for the marked dyspnoea on the basis of the narrowing of the lumen of the trachea. The tumor may have been drawn into the thoracic cavity during inspiration. It would not have been possible to remove this tumor surgically. X-ray therapy might have been beneficial. Cases have been reported in which thymic tumors disappeared after X-ray treatment, but the nature of these tumors was not definitely recorded.

The prognosis is always unfavorable. A duration of two years is not rare, but death may occur after twenty-six days. In the case reported by the authors the disease was probably present for several years. The tumor was clearly a slowly growing neoplasm of a low grade of malignancy. ALTON OCHSNER, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Meyer, J. L.: Mesenteric Vascular Occlusion. *Ann. Surg.*, 1931, xciv, 88.

Accurate statistics of the frequency of mesenteric vascular occlusion are not available. In 10 per cent of the cases reported the condition was not discovered at operation. It may occur at any age. In most cases there is disease of the cardiovascular system. In the majority of cases the condition goes on to ulceration and gangrene. It is not always possible to determine from the appearance of the bowel whether or not gangrene will ensue.

This article is based on ninety-two cases of mesenteric vascular occlusion which have been reported in the last ten years.

The symptoms vary considerably. In all of the cases reviewed by the author there was severe pain. The incidence of such symptoms as nausea and vomiting, rigidity or distention of the abdomen, fever, and diarrhoea varied from 10 to 50 per cent. The leucocyte count approached 18,000 in all but three cases. The author believes that severe abdominal pain unrelieved by enemata and accompanied by bowel dysfunction and a high leucocyte count should suggest the presence of mesenteric thrombosis.

Early recognition of the condition is essential. Surgical removal with anastomosis of the healthy bowel will give the best results. Thorough pre-operative preparation is very important. Digitalis and salt solution should be employed as indicated.

The author reports the case of a woman sixty-three years old who recovered following resection and anastomosis of the bowel although at the time of operation she was almost pulseless.

WILLIAM J. PICKETT, M.D.

Larson, L. M.: Mesenteric Vascular Occlusion. *Surg., Gynec. & Obst.*, 1931, liii, 54.

Occlusion of the mesenteric vessels is generally regarded as a comparatively rare condition; however, it occurs often enough to require consideration whenever obscure abdominal lesions are encountered. It is of importance because of its severity rather than its frequency. On account of the difficulty in its diagnosis and the usual conception of its rarity, many cases undoubtedly remain unrecognized clinically and death is ascribed to some condition such as postoperative ileus or peritonitis.

Larson reviewed thirty-six cases of mesenteric vascular occlusion in which autopsy was performed. The subjects were between twenty-two and seventy-eight years of age. The average age was fifty-two and two-tenths years. Twenty-six of the patients were men. The most common cause of arterial embolism was mural cardiac thrombi. The most common

causes of arterial thrombosis were arteritis and arteriosclerosis of the mesenteric artery. Venous mesenteric occlusion most often resulted from a septic process in the gastro-intestinal tract or the pelvis and was of the ascending type. Less often, it was a descending process caused by thrombosis in the portal vein. In 25 per cent of cases it followed hepatic disease.

The vascular occlusion affected the arteries in fourteen cases, the veins in sixteen, and both veins and arteries in six. In all of the cases of arterial occlusion and in all but one of the cases of venous occlusion the superior mesenteric vessels were involved. In eight of the thirty-six cases the source of the vascular occlusion was unknown or was problematical. Haemorrhagic infarction resulted in thirty-one of the thirty-six cases. When intestinal infarction took place, it was generally manifested by symptoms of intestinal obstruction which were indistinguishable from those of other types of obstruction. Typically, it occurred in an elderly person, starting with extremely severe, colicky abdominal pain, nausea, vomiting, and diarrhoea. The vomitus and the diarrhoeal stool were often mixed with blood. Occasionally, complete retention of faeces occurred. Soon the pain became steady, the shock more severe, the abdomen distended and tympanitic, and the temperature and pulse, which at first were likely to be subnormal, became progressively elevated. Later, signs of general peritonitis developed and death resulted. In a few cases an abdominal tumor could be palpated.

Arterial occlusion and combined arterial and venous occlusion presented symptoms which were usually more acute and fulminating than those of venous closure. The symptoms produced by closure of the main trunk were indistinguishable from those produced by obstruction of the branches. The course of the disease is short and may be less than forty-eight hours. In at least 53 per cent of the cases, definite peritonitis was present, and in 55 per cent bloody ascites occurred.

GASTRO-INTESTINAL TRACT

Paolucci, F.: Healing of Gastric Wounds in Normal and Sensitized Rabbits. An Experimental Contribution to the Anaphylactic Theory of Gastric Ulcer (La guarigione delle ferite gastriche nei conigli normali ed in quelli sensibilizzati. Contributo sperimentale alla teoria anafilattica dell'ulcera gastrica). *Ann. ital. di chir.*, 1931, x, 646.

In rabbits sensitized *per ore* and by the method of Arthus there was marked retardation of healing of gastric wounds due to the fact that acute ulceration took place at the same time.

EUGENE T. LEDDY, M.D.

Fitzgerald, R. R.: Chronic Follicular Gastritis: With a Report of Nine Cases. *Brit. J. Surg.*, 1931, xix, 25.

In the nine cases of chronic follicular gastritis reported by the authors there were symptoms or signs suggesting chronic ulcer, but no ulcer was found at operation or in the gross specimen. In all of the cases, however, histological study of the portion of the stomach removed at operation showed a lesion characterized chiefly by infiltration of the mucous membrane by inflammatory cells which in places formed large follicles with germinal centers.

Partial gastrectomy cures or gives relief in most cases of this type and fails in only a small number. Therefore until the cause of the condition is known it should be the treatment of choice when conservative measures fail. In cases in which pylorospasm is present, pyloromyotomy probably has a place although it does not assure freedom from subsequent hæmorrhage or cancer. **SAMUEL KAHN, M.D.**

Sole, R.: The Treatment of Gastric Ulcer (Tratamiento de la úlcera gástrica). *Congreso argentino de cirugía*, Buenos Aires, 1930, p. 3.

In a review of forty cases of gastric ulcer, Sole states that this lesion is only one manifestation of a profound change which has affected the entire first portion of the digestive tract. Therefore surgical intervention which treats only the ulcer and neglects the condition of the rest of the organ is inefficient. The principal object of the author's work has been to investigate the pathological anatomy of the antral portion of the ulcer bearing stomach in order to determine the degree of extension and the intensity of the associated gastritis which he found present in every case. He believes that the symptoms may be explained by the concomitant gastritis as well as by the ulcer itself. He therefore advocates not merely local excision of the ulcer, but wide resection of the ulcer with the part of the stomach affected by the gastritis. It is his opinion that if this associated disease had been fully appreciated, the operations of mere excision or cauterization of the ulcer would never have been devised or employed as they do not remove the diseased gastric mucosa. He has never seen any inconveniences to the performance of gastric resection, and thinks the end-results are much better. He has never seen a recurrence of peptic ulcer following wide resection provided the resected portion included the ulcer, the pyloroduodenal region, all of the antrum, the major portion of the lesser curvature, and a good portion of the fundus. The technique employed is a modification of the Polya operation.

In conclusion he summarizes the advantages of the widest possible resection as follows:

1. The operation removes all of the acid-bearing portion of the stomach and the area of chronic gastritis.

2. The ulcer is removed.

3. If the supposed ulcer turns out to be a neoplasm, the best possible procedure has been followed.

4. The end-results are better than after other operations.

5. The mortality, which has been between 2½ and 3 per cent, is lower than that of gastro-enterotomy. **FRANCIS M. CONWAY, M.D.**

Weir, J. F., and Johnson, W. R.: Various Clinical Syndromes Due to Carcinoma of the Stomach. *Med. Clin. North Am.*, 1931, xv, 163.

The authors state that a third of all carcinomata in men and a fifth of all carcinomata in women occur in the stomach; that in the present state of our knowledge surgery is the only form of treatment of gastric carcinoma which merits consideration; and that failure to recognize gastric carcinoma in its resectable state is the most formidable hindrance to successful treatment of the condition.

Of 1,408 cases of gastric carcinoma observed at the Mayo Clinic during the period from 1918 to 1920, resection was done in 20 per cent, whereas of 2,087 cases observed in the period from 1920 to 1924, inclusive, resection was possible in 25 per cent. The increase in operability in recent years has been due to several causes. The campaign of education of the laity and the medical profession is undoubtedly bearing fruit. Probably the most important factors in the progress made have been the introduction, improvement, and more general use of roentgen-ray examination. The diagnosis of the various types of dyspepsia has improved. Physicians in general are becoming keener in their recognition of the earlier symptoms of neoplastic processes in the stomach. Teamwork of the physician, roentgenologist, surgeon, and pathologist has become more common. Exploration is being done earlier. In 53 of the Mayo Clinic cases reviewed by McVicar and Daly, resection was found possible on exploration when the findings of roentgen examination suggested inoperability. Unless there is definite evidence of inoperability, exploration will always be justifiable if a competent surgeon and modern surgical facilities are available. Another factor in the improvement of the treatment of gastric cancer has been the recognition of the malignant ulcer and of the malignant transformation of benign ulcer by clinical and histopathological study, such as that of MacCarty, of small lesions removed at operation. It seems reasonable to believe that there are 3 types of ulcerating lesions: 1 which remains benign, 1 which eventually becomes malignant, and 1 which is carcinomatous from the start.

Factors which have impeded progress in the treatment of malignant gastric diseases are:

1. The relatively high degree of malignancy of neoplastic diseases of the stomach.

2. Inoperability of the lesion when the first symptoms are noted by the patient. Weir and Johnson are of the opinion that the frequency of cases of this type has been exaggerated in the literature, but believe that some persons have such a high threshold for pain that they are almost wholly unaware of disease in the digestive tract until stasis,

obstruction, or severe pain and discomfort due to perforation or other complication develops.

3. Failure of the patient to seek treatment until the symptoms become alarming.

4. Failure of the physician to recognize the condition. In many instances the physician errs by making an incomplete examination. He may underestimate the gravity of the symptoms. He may lack facilities and training, or he may misinterpret his observations or may be unaware of the seriousness of a circumscribed intragastric lesion. Textbooks and college teaching emphasizing retention, achlorhydria, a palpable tumor, loss of weight, and anemia as the criteria for diagnosis undoubtedly have been important factors delaying diagnosis.

5. Refusal of the patient to submit to surgical intervention. An important reason for this is the belief of many laymen and some physicians that carcinoma of the stomach has a hopeless prognosis.

On account of the present availability of skillful surgeons and surgical facilities, the authors do not accept the view of certain physicians that carcinoma of the stomach is incurable at all stages. The immediate mortality after skillful surgical procedures is not formidable. Balfour reported a series of 113 consecutive operations for malignant disease with only 9 deaths. Pre-operative preparation to combat anemia, dehydration, and toxemia and the recent developments in anesthesia have contributed to such excellent records. As the cause of carcinoma is unknown and as we lack a specific test for the presence of the condition, further progress in the cure of gastric carcinoma must depend on earlier diagnosis and surgical treatment. This can be attained only by continued education of both the laity and the medical profession. The physician must bear the possibility of carcinoma constantly in mind and use every means to make a correct diagnosis. Even when an intragastric lesion is demonstrated a decision as to its benignancy or malignancy may sometimes require surgical procedures and histological examination.

The authors report seven cases.

Wangensteen, O. H.: *Elaboration of Criteria upon Which the Early Diagnosis of Acute Intestinal Obstruction May Be Made, With Special Consideration of the Value of X-Ray Evidence.* *Radiology*, 1931, xvii, 44.

The present high mortality of intestinal obstruction is due to the fact that the physicians often wait for the development of obstipation, regurgitant vomiting, and abdominal distention before making the diagnosis. It is not generally appreciated that the physical findings in intestinal obstruction are negligible unless strangulation is present and that gas and feces are expelled with an enema in intestinal obstruction.

The value of X-ray examination in the detection of bowel obstruction has long been recognized. Collections of gas in the small bowel indicate intestinal stasis. Whether the stasis is mechanical

or paralytic may be determined by the use of the stethoscope.

In simple obstruction of the small bowel, the collection of gas appears within four or five hours. When the obstruction is in the colon, more time may elapse. When the obstruction is due to strangulation or vascular occlusion, the shadow of gas in the small bowel does not appear as early as in simple obstruction.

The author describes the use of the X-ray in cases of imperforate anus and intussusception. In imperforate anus, the child is held upside down and the ascent of the gas indicates the point at which the bowel most nearly approaches the skin. In intussusception, a barium enema may often reduce the invagination. Wangenstein believes that about 70 per cent of invaginations in children are of the ileocecal type, in which this method is effective if the child is seen early. CHARLES H. HEACOCK, M.D.

Lind, S. C.: *Simple Ulcer of the Intestine.* *Ohio State M. J.*, 1931, xxvii, 621.

Although ulceration of the intestine is frequently found associated with such diseases as typhoid fever, uræmia, amebic dysentery, and tuberculosis, a simple non-specific ulcer may occasionally occur in the absence of a systemic disease. The ulcer itself is the disease. The cause has not been established although various theories have been advanced. Some of the simple ulcers may be due to thrombosis of the arteries of the intestinal wall. Lind believes it is most reasonable to consider the ulcers as the result of injury to the intestinal mucosa by foreign bodies such as seeds or bones.

The simple ulcer may give rise to only vague and indefinite minor subjective symptoms, but may perforate suddenly and cause general peritonitis. In some cases it may become chronic and cause the formation of adhesions to surrounding structures. In others, it may heal by the development of fibrous tissue and stenosis of the intestine.

The ulcer involves the mucosa and submucosa and forms a funnel-shaped crater, the edges of which are somewhat thickened or indurated. The adjoining intestine is quite normal. When the process is more chronic, fibrous tissue is present in the ulcer. Ulcers of the small intestine occur twice as often in the ileum as in the jejunum, and are usually in the lower ileum.

The symptoms noted before perforation are vague abdominal pain, anorexia, and nausea. When perforation occurs the pain becomes excruciating and shock is present in varying degrees. Perforated ulcers of the small intestine are usually diagnosed as appendicitis or perforated ulcer of the duodenum or stomach. Stenosing ulcers cause symptoms of obstruction.

In cases of perforation, surgical treatment is urgent. Critically ill patients are poor subjects for a prolonged operation. If the perforation is not found and the condition of the patient precludes an extended search for it, drainage and a postoperative

"peritonitis régime" offer a slender hope. If the perforation is found it may be sutured or excised or the segment of bowel may be resected. The surgeon must do what seems best in the particular case.

Lind reports three cases. In the first one an ulcer of the lower ileum perforated and caused fatal peritonitis. Diarrhœa at intervals for four months before the perforation suggested that the ulcer had been present for some time. In the second case, a 20 in. segment of ileum was found to be the site of subacute inflammation and ulceration. This condition was discovered accidentally during an operation for the repair of an incisional hernia. Resection of the affected ileum was followed by recovery. The third case reported was that of a patient with an ulcer of the ascending colon. The lesion had not perforated, but the serosa was injected and the omentum was adherent to the affected area of the colon.

EARL GARSIDE, M.D.

Heacock, C. H.: Obstructive Lesions of the Small Bowel. *Radiology*, 1931, xvii, 119.

Obstructive lesions of the small bowel may be classified as acute or chronic. Those of the acute type are revealed roentgenologically by the collection of gas in the small bowel. The gas appears long before distention can be observed clinically and is usually apparent in either the herring-bone formation or the ladder pattern. These two types definitely indicate surgical treatment. The administration of barium is not necessary in acute cases.

In partial obstruction or chronic cases, gas is seldom found in the small bowel. Following the administration of barium, the obstruction is manifested by dilated loops of small bowel and a progressive slowing up of the intestinal current until the point of partial obstruction is reached. No untoward effects have been noted after the administration of barium.

Prat, D.: Ileus: Intestinal Occlusion and Obstruction (Ileo occlusion y obstrucción intestinal). *An. Fac. de med. y Univ. de Montevideo*, 1931, xvi, 49.

This is an exhaustive discussion of the classification, symptoms, diagnosis, prognosis, and treatment of ileus together with the detailed histories of a number of cases of different types.

The first case reported was one of ileus from neurosis of the diaphragm with enormous distention of the abdomen. The symptoms were those of intestinal occlusion, but when the patient was anesthetized the distention subsided and an exploratory incision revealed nothing abnormal. Uneventful recovery resulted.

In three cases reported the ileus was due to intestinal infarction caused by obliteration of the mesenteric vessels. This form of ileus is characterized from the beginning by severe intoxication and profound collapse. The pulse is rapid and small like that associated with internal hemorrhage and disappears intermittently. The abdomen is distended, but is dull on percussion. In all of the three cases reported

operation was followed by death. This form of ileus has a more unfavorable prognosis than any of the others.

The author reports also cases of intestinal invagination. Invagination occurs frequently in infants and young children. It is characterized by signs of occlusion and the passage of blood from the anus. Life can be saved only by early diagnosis and immediate operation. If operation is performed within twenty hours after the beginning of the symptoms the prognosis is not extremely unfavorable, but if it is performed later the mortality is very high. In invagination in infants reduction by irrigation should not be attempted. In invagination in adults, which is more apt to be subacute or chronic, it is tried by some surgeons, but the author has usually found it unsuccessful.

Prat describes the different forms of invagination. The most common is the ileocolic type. The operations performed for this condition are simple extirpation of the invaginated cylinder after incision of the invaginating cylinder, enterectomy or resection of all of the affected part of the intestine, and entero-anastomosis with or without exclusion. The first operation has been almost given up, but Prat thinks it still has its indications as the mortality of resection is very high. He emphasizes that the choice of operation depends upon the patient's general condition.

AUDREY GOSS MORGV, M.D.

Fleming, B. L.: Acute Perforation of Duodenal Ulcers: Causes of Death and a Consideration of Treatment. *J. Am. M. Ass.*, 1931, xcii, 6.

Acute perforation of a duodenal ulcer demands prompt surgical treatment.

In a review of the literature the author found the records of 253 deaths in approximately 1,000 cases. Acute diffuse peritonitis was the cause of 65 per cent of the fatalities reported in the literature and of 41 per cent of 17 deaths occurring in the author's cases.

Fleming is of the opinion that the presence of bacteria in the foreign material ejected into the abdominal cavity has not received sufficient consideration by surgeons. In 1926, Bruett reported on cultures of the abdominal fluid taken from 126 patients who were operated upon from six to twelve hours after the perforation. Seventy-four per cent of the cultures were positive. In the author's cases coming to operation twelve or more hours after the perforation, 93 per cent of the cultures were positive. Hemolytic streptococcus, streptococcus viridans, bacillus coli, and staphylococci were found.

Thirty-three (13 per cent) of the deaths reviewed were due to pulmonary complications, the most frequent of which were atelectasis and pneumonia. Death occurring in the first forty-eight hours is practically always due to atelectasis.

Fifteen (5.09 per cent) of the deaths reviewed were attributed to subdiaphragmatic abscess. The abscess was accompanied by empyema and multiple lung abscesses. From the meager data obtainable, it

appears that there may be a relationship between this lesion and drainage used at or near the site of perforation.

Nineteen (7.5 per cent) of the deaths reviewed were due to shock. Shock may be well combated or prevented by the administration of morphine to relieve pain and place the patient at rest, the administration of saline solution by hypodermoclysis or intravenously with glucose solution to raise the blood pressure, the use of external heat and woolen blankets to conserve the body heat, and the use of the proper anæsthetic, preferably a local anæsthetic or nitrous oxide and oxygen. Angulation of the operating table from 10 to 15 degrees with the head end elevated is recommended.

Atelectasis is combated by inhalations of from 5 to 10 per cent carbon dioxide and oxygen for five-minute periods every two hours. This lowers the viscosity of the bronchial secretion, facilitates expectoration, and induces deep breathing, thereby expanding the collapsed lung.

Irrigation of the abdominal cavity because of the presence of foreign material is condemned. Drainage of the upper part of the abdomen is not recommended unless the patient comes to operation late and suppuration has taken place. Suprapubic drainage with a rubber tube in the pelvis is advisable. Complete intestinal rest is of great importance. Fleming believes that early feeding by mouth or rectum is contra-indicated as it stimulates early peristalsis. He urges more frequent use of normal saline solution by hypodermoclysis.

CHARLES F. DUBOIS, M.D.

Gallo, A. G.: **Ileoæcal Tuberculosis; Clinico-surgical Considerations** (Tuberculosis ileo-æcal; consideraciones clinico-quirurgicas). *Semana méd.*, 1931, xxxviii, 1345.

After a lengthy review of several articles on ileo-æcal tuberculosis which have been published since 1884, Gallo discusses the types and most common localizations of the lesion, the findings of roentgen examination, the symptoms, and the differential diagnosis.

In the majority of cases the condition is secondary to tuberculosis elsewhere. In some of the cases in which it appears to be primary in the intestine, lesions in other organs have doubtless been overlooked. The results of operations are best when other foci are not found. Medical treatment may be very beneficial, but eventually surgical treatment becomes necessary. Medical treatment consists of measures to improve the general condition and alleviate the gastric symptoms and heliotherapy. In Gallo's opinion, the ideal surgical treatment is resection of the ileoæcal segment in one stage, but the presence of lesions elsewhere often forces the surgeon to perform the operation in two stages. Pulmonary tuberculosis is not a contra-indication to operation unless the general condition is very poor. After surgical treatment, medical treatment should be continued indefinitely.

FRANCIS M. CONWAY, M.D.

Ogilvie, W. H.: **The Preservation of the Ileoæcal Sphincter in Resection of the Right Half of the Colon.** *Brit. J. Surg.*, 1931, xiv, 8.

Resections of the colon are performed most often for the removal of malignant growths. Friedrich's operation, resection of the intestine from a point 6 in. above the ileoæcal valve to a point 4 in. below the hepatic flexure, with the peritoneum overlying the ileocolic and right colic arteries and the lymphatics accompanying them, has for many years been accepted as an eminently satisfactory procedure for the treatment of operable cancer in the right half of the colon. However, this operation removes one of the most important pieces of mechanism in the physiology of digestion, the ileoæcal sphincter.

The ileoæcal opening is a muscular sphincter which does not depend in its action upon a valvular mechanism. The chief function of the ileoæcal sphincter is to prevent the ileal contents from passing too rapidly into the cæcum. The sphincter has the same effect on the contents of the terminal ileum as the pyloric sphincter has upon the contents of the stomach, controlling the outflow so that sufficient time may elapse for the complete digestion and absorption of foodstuffs. This physiological ileal stasis is so well regulated that the chyme which enters the cæcum contains only very small quantities of nutritive material in solution.

The author describes a resection of the right half of the colon in which the ileoæcal sphincter was transplanted in order to preserve its function. In the two cases which have been treated in this manner the immediate results have been very satisfactory. However, the operation is difficult and severe and by no means without risk.

SAMUEL KAHN, M.D.

Luccioni, C.: **A Contribution to the Study of the Formation of Pericolic Membranes** (Contributo allo studio delle formazioni membranose pericoliche) *Arch. ital. di chir.*, 1931, xxix, 361.

The author reports seven cases of pericolic (Jackson's) membrane which were studied clinically and roentgenologically and treated surgically. He believes that Jackson's membrane is of congenital rather than inflammatory origin. He emphasizes the importance of a careful and complete X-ray examination as this will reveal the membrane if it has interfered with the physiological processes of the right colon.

EUGENE T. LEDDY, M.D.

Mercer, W.: **Hirschsprung's Disease. The Report of a Case Treated by Lumbar Ganglionectomy and Ramisectomy.** *Edinburgh M. J.*, 1931, xxxviii, 105.

Hirschsprung's disease is characterized by dilatation of all or a part of the colon with hypertrophy of the wall, but without evidence of organic obstruction. Although Hirschsprung gave his name to this condition, he has no claim to priority in its discovery. The disease has been said to be of two distinctly different types, one type occurring in adults over fifty years of age, and the other being un-

doubtedly congenital. It is more common in males than in females. The pathological changes are usually confined to the colon; in one-third of the cases only the sigmoid is involved. The colon is enormously distended and enlarged, and its muscular wall is greatly hypertrophied. The mucous membrane is stretched and smooth and often shows areas of ulceration which develop as a result of mechanical irritation from the impacted feces.

Hirschsprung's disease is accompanied by obstinate constipation and abdominal distention. In the congenital type the symptoms generally appear during the first few days of life. It is not unusual for bowel movements to occur only at intervals of two, three, or four weeks. In some cases three months have elapsed between evacuations. The stools are malodorous. As a rule they are inspissated, but occasionally they are very loose. In the latter case, the fluid intestinal contents have trickled past large fecal impactions. In spite of the infrequency of bowel movements there are rarely any symptoms of toxic absorption. The abdominal distention may become very extreme. The patient is usually emaciated and drowsy. Dyspnea, cardiac embarrassment, and edema of the extremities may occur.

The etiology of the disease is still obscure. Mechanical causes such as torsion of the pelvic colon or the drag of a prolapsed colon have been considered. The dilated colon has been thought by some to be a congenital anomaly. Chronic colitis has been suggested as the causal factor. According to the theory most widely accepted today, the lesion is the result of a neuromuscular fault. Many now believe that it is due to hyperactivity of the sympathetic innervation of the rectum. A sympathetic hyperactivity will cause achalasia of the sphincters with inhibition of tone and motor activity of the bowel wall leading to fecal accumulation, stretching of the plain muscle, and growth hypertrophy.

The treatment has been both medical and surgical. The medical treatment has been essentially the treatment of constipation. A number of surgical procedures have been advocated. Plication of the large colon and short-circuiting operations have been disappointing. Resection of the affected portion of the colon has given fairly good results. The treatment now considered most successful in the majority of cases is lumbar ganglionectomy and ramisection. As a rule it is necessary to remove the sympathetic chain only on the left side. The fourth lumbar ganglion is exposed at the brim of the pelvis and the sympathetic trunk is divided below it. All of the rami, including those to the spinal nerves, the hypogastric plexus, and the aortic plexuses, are then divided. The dissection is carried upward to include the third and second lumbar sympathetic ganglia and the trunk is divided above the second lumbar ganglion.

After the operation enemata and laxatives are usually administered for about two months.

Mercer reports a case of Hirschsprung's disease in a boy nine years old who had been constipated from

birth and required enemata nearly every week. On a few occasions there was a long interval between bowel movements. At one time no stool was passed for three months. Intervals of eight weeks between stools were frequent. At the time of the patient's admission to the hospital the circumference of the abdomen at the level of the umbilicus was 30 in. Lumbar ganglionectomy and ramisection were performed. Enemata were used for eighteen days after the operation. Thereafter daily bowel movements were maintained by the administration of liquid paraffin and cascara, the patient became cheerful and active whereas previously he had been languid and drowsy, his appetite became good, and he passed a normal stool every day. ALTON OCHSNER, M.D.

Leveuf, J., and Odru, M.: Diffuse Polyposis of the Colon (*La polyposse colique diffuse*). *J. de chir.*, 1931, xxxvii, 809.

The case reported was that of a young woman with profuse intestinal hemorrhages which were at first ascribed to duodenal ulcer. An increase of the bleeding under treatment for duodenal ulcer led to a proctosigmoidoscopic examination. This revealed intestinal polyposis. After further aggravation of the condition, exteriorization and subsequent resection of the sigmoid were done. Sudden collapse was followed by death.

Autopsy disclosed sessile and pedunculated polyps scattered over the entire colon with the exception of the rectum. Microscopic examination showed the polyps to be adenomata consisting of a single layer of covering epithelial cells, enlarged and ramified glands of the usual rectal type, enlarged blood vessels, and a normal submucosa.

The treatment of choice in polyposis of the colon is a one-stage colectomy. When the patient is unable to withstand this operation the author recommends exclusion of the colon and irrigation with magnesium chloride. If the condition is not satisfactorily ameliorated by this treatment, he recommends secondary colectomy. JOHN W. BRENNAN, M.D.

Gunn, H., and Howard, N. J.: Amoebic Granulomata of the Large Bowel: Their Clinical Resemblance to Carcinoma. *J. Am. M. Ass.*, 1931, xcvi, 166.

Gunn and Howard report three cases of amoebic granuloma of the large bowel in which the symptoms and the gross appearance of the tumors suggested carcinoma. They review also six similar cases reported by others. They state that many references to tumors or masses that disappeared after anti-amoebic therapy are to be found in the literature.

In the differential diagnosis of amoebic granuloma the roentgenogram is of value. At the site of the deep amoebic ulceration there is considerable distortion of the bowel by adhesions. The filling defect of the bowel is caused by a thickening of the bowel wall, and the great extent of this defect makes a diagnosis of carcinoma unlikely. In the cases of patients with amoebiasis of long standing, the thickened bowel may

frequently be felt through the abdominal wall. The granulomatous masses are found most often in the cæcum and at the flexures of the colon.

In the authors' cases there was a massive isolated ulceration of the large intestine. On microscopic examination the entamœba histolytica was found in nests in the ragged necrotic base of the ulcers and throughout the ulcerated area. The cellular infiltration around the ulcerations was made up of eosinophilic leucocytes, plasma cells, and focal collections of lymphocytes. Large amounts of fibrous tissue had replaced the destroyed muscularis and subserosa. The mesocolic fat showed similar changes. The tumor masses in this condition become quite large, cause narrowing of the bowel lumen, and interfere with the motility and function of the bowel.

In the differentiation of the amœbic granuloma from carcinoma the stools must be examined for the amœbæ, the base of the ulcer very carefully studied for nests of amœbæ, and the X-ray findings correctly interpreted.

Early in the course of the disease, anti-amœbic treatment may be of value, but in cases of long standing with large anatomical defects surgical removal offers the best prognosis.

ARTHUR H. KLAUWANS, M.D.

Finsterer, H.: Surgery of the Colon (*Die Chirurgie des Dickdarms*). *Arch. f. klin. Chir.*, 1931, clxiv, 349.

On the basis of 404 colon operations performed in a period of twenty-three years Finsterer reviews what he considers the fundamental principles of colon surgery.

Repeated observations have demonstrated that total extirpation of the colon may be performed without disturbing the general health and may even be followed by a considerable increase in the body weight. Simple rotations of a mobile cæcum to from 90 to 180 degrees may untwist spontaneously after morphine injection. Severe circulatory disturbances occur only if the rotation is 180 degrees or more. In very extreme cases of mobile cæcum with a free ascending colon, it is advisable to fix the mesentery and the ascending colon to the posterior and lateral abdominal walls. Fixation of the transverse and ascending colon side by side by adhesions may be differentiated from the parallel coursing of the 2 bowel loops without adhesions by roentgen-ray examination. Acute obstruction from valve closure at the splenic flexure may often be relieved without operation by the injection of atropine and a high enema. In Hirschsprung's disease it is sufficient to resect only the descending colon and the sigmoid-flexure for complete relief (Ishikawa's and Kleinschmidt's experimental investigations).

In the acute stage of obstruction of the large bowel, the purpose of operation is first merely to relieve the obstruction or to evacuate the retained bowel contents through an intestinal fistula. If in volvulus of the cæcum the bowel wall is already damaged, resection must be done in 1 or 2 stages.

The author has operated upon 2 cases of volvulus of the transverse colon; one of the patients died seven years after the operation at the age of seventy-eight years, and the other died twelve days after the operation. In volvulus of the sigmoid flexure general anæsthesia should be entirely or almost entirely avoided. In very recent cases immediate resection is permissible. Of 10 cases, Finsterer did a r-stage resection in 7 without a fatality. The literature also shows that in volvulus of the sigmoid flexure the r-stage resection yields better results than the 2-stage operation. The formation of an entero-anastomosis between the basal portions of the flexure is not to be recommended. The author has operated twice for valve closure at the splenic flexure. In one case he performed a colostomy, and in the other he divided the phrenicocolic ligament by Payr's method. Both patients were discharged cured.

In chronic obstipation, entero-anastomosis is apt to be followed by increasing symptoms which render secondary resection necessary. It is permissible only in the presence of an organic stenosis. As a means of improving the function of the weak muscled, dilated cæcum, the cæcoplication which is performed after appendectomy has repeatedly proved of value. Although resection of the cæcum and ascending colon to the beginning of the transverse colon is a relatively simple procedure, its permanent results leave much to be desired. Of 6 cases cited by Finsterer, it was followed by recovery in only 3 and improvement in 2. In cases of mobile cæcum, resection of the cæcum and a portion of the colon, as described by Schmieden, is the best method of treatment. In obstructions at the splenic flexure, colocolostomy in addition to division of the phrenicocolic ligament by Payr's method may be considered in only particular cases. It should be done as closely as possible to the stenosis, between the transverse and descending colons. In megasigma the attempt may be made to enlarge the base of the flexure to normal by a plastic operation. In 1 case the author relieved the symptoms completely by this method. He emphatically advises against anastomosis between the bases of the sigmoid flexure and against a double anastomosis between the transverse colon and the sigmoid flexure on one side and the loops of the flexure on the other. Ileosigmoidostomy is quite useless for the relief of chronic obstipation. In unilateral exclusion with blind closure of the distal ileum and implantation of the proximal ileum into the flexure, the immediate results are good, but the late results are poor. The most radical procedure is resection of the colon, which is not considered a particularly dangerous operation.

In so-called spastic obstipation left-sided hemicolectomy is indicated. The excision must be as extensive as possible as otherwise a recurrence will develop. In 41 cases in which the author performed a resection for chronic obstipation there was only 1 death immediately following the operation. Autopsy in the fatal case revealed recent lobular pneumonic foci in both lower lobes and degeneration of

the heart, but no peritonitis. Five years after resection of the sigmoid flexure 9 of 12 patients were found to be completely cured, 1 showed improvement, and 1 showed no improvement. The result in 1 case is not known. The patient whose condition was unimproved was cured later. Of 10 patients subjected to a left-sided hemicolectomy, 8 remained entirely symptom-free for from five to fourteen years. The result in 2 cases is unknown. After hemicolectomy for spastic obstipation, 4 of 5 patients were completely relieved for from six to thirteen years and 1 was greatly benefited. Total colectomy for the relief of chronic obstipation is considered, in general, too dangerous. The difficult peritonealization of the bed of the ascending colon is a particular disadvantage. Total colectomy will always remain an operation to be performed only exceptionally. In most cases of megacolon and in so-called spastic obstipation, left-sided hemicolectomy is the procedure of choice.

In fecal fistulae, attempts to cure by extraperitoneal suture are useless. The only procedure to be considered is total exclusion of the bowel with implantation of at least 1 lumen, and preferably of both lumina. Simple entero-anastomosis is worthless, and primary resection is contra-indicated because of the great danger of peritonitis. Bilateral bowel exclusion is almost entirely free from danger. Finsterer used this procedure in 12 cases without a death. Secondary extirpation is easy and safe because the free peritoneal cavity is not opened (closure of both ends of the excluded loop is incorrect).

Of the acute inflammations of the bowel, perforation of a dysenteric ulcer demands the most prompt operation. Finsterer operated upon 5 cases of severe dysentery, performing 3 caecostomies and 2 ileostomies. In acute phlegmonous inflammation of the colon only the earliest operation will effect a cure. The author reports a case of subacute phlegmon of the ascending and transverse colons in which death occurred two years later from recurrence. In ulcerative colitis, surgical intervention is to be considered in only the most severe cases. In moderate and mild cases a Witzel fistula should be made or appendicectomy should be done. In severe cases, complete rest should be given to the bowel by excluding the diseased portion. Caecostomy or colostomy should be done under local anesthesia. The exclusion must be maintained for at least from one to two years. Occasionally, total or subtotal colectomy will be necessary. The danger of colectomy lies in the insecurity of the bowel suture in the inflamed tissue.

Polypoid of the colon is easily mistaken for papillary carcinoma. It is often considered the precursor of cancer. Total resection (Schmieden) is indicated only in the exceptional case.

Acute perforation of a colonic diverticulum requires immediate laparotomy. In chronic diverticulitis, colon resection gives good results.

Inflammatory caecal tumors may be healed by simple entero-anastomosis. In cases of pseudotumors

of the left half of the colon, colostomy is sufficient to effect recovery, but it is important to rule out carcinoma with certainty. Finsterer has done colon resection 3 times for pseudotumor—twice for stenosing carcinoma and once for tuberculosis of the caecum. All of the patients recovered. In the hypertrophic form of colonic tuberculosis simple exclusion is possible, but stenosing scars usually remain. The ulcerous form has a more favorable prognosis. Roentgen therapy may result in recovery. Resection of the diseased caecum is still the best and most radical treatment. If this is not possible, total exclusion with implantation of both lumina into the abdominal wall should be done. In 12 cases in which the author performed a resection there were 2 deaths. Ten patients who were subjected to simple and total exclusion were discharged cured. Finsterer cured a fibroma of the sigmoid flexure by resection of the flexure and implantation of the intestinal lumina into the abdominal wall followed by later resection of the artificial anus. *BERGMANN (Z).*

Tasche, L. W.: Appendicitis in Children. *Am. J. M. Sc.*, 1931, *CLXXII*, 86.

Tasche discusses briefly some of the problems arising in the diagnosis and differential diagnosis of appendicitis in children and reviews 111 consecutive appendectomies performed on children under thirteen years of age which constituted 15.8 per cent of 700 appendectomies done over a period of nine years. Two and six-tenths per cent of the children were under five years of age. The youngest child was two years and seven months old. The number of males and the number of females were about equal. The incidence of the condition during the fall was about double the incidence during the spring. The number of cases occurring during the summer and winter seasons ranked respectively between the numbers occurring in the fall and spring. In 13 per cent of the cases there was a history of a recent previous acute infection. The most common recent infection was a respiratory disease. A definite history of previous attacks of appendicitis was given in 31 per cent of the cases.

The condition was of 5 types: (1) interval appendicitis, (2) acute suppurative appendicitis, (3) acute suppurative appendicitis with local peritonitis, (4) acute suppurative appendicitis with abscess, and (5) acute suppurative appendicitis with diffuse peritonitis. Clinically it was classified as mild, moderate, severe, or hopeless. All appendices were examined grossly and microscopically by the pathologist. The pathological report was acute suppurative appendicitis, acute recurrent appendicitis (previous infection evidenced by scarring or perivascular infiltration of round cells), or absence of inflammation.

Each group of cases is summarized, the information given including the number of cases, the clinical classification, the microscopic findings, the average leucocyte count, the average polymorphonuclear percentage, the temperature, the corresponding pulse, and the mortality.

Tasche concludes that there is usually a fair degree of correlation between the clinical picture and the surgical and pathological findings, but that occasionally the correlation is poor.

In 19 cases the urine contained white blood cells, and in 1 of the 19 it contained both white and red blood cells.

In discussing the leucocyte counts, Tasche states that a leucopenia usually means a fatal outcome.

The mortality in the 111 cases was 6.3 per cent. The most frequent cause of death was diffuse peritonitis.

In conclusion the author says that the length of time between the onset of symptoms and the operation is probably the most important factor determining the pathological changes and prognosis.

C. G. SHEARON, M.D.

Friedenwald, J., and Morrison, T. H.: The Clinical Significance of So-Called Chronic Appendicitis. *Ann. Int. Med.*, 1931, v, 1.

With the advent of roentgenological study of the appendix numerous variations in the size, shape, and position of the organ have been observed. Operation has frequently been undertaken upon the basis of such observations alone, often with unfavorable results. The authors believe that a careful study of the embryology of the appendix will show the cause of many errors in diagnosis.

The clinical signs of chronic appendicitis are rarely distinctive. Pain and tenderness in the right lower quadrant of the abdomen may be due to many other conditions in the digestive tract, pelvis, or abdominal wall. Deaver maintained that chronic appendicitis is a distinct entity, while Carnett has demonstrated that patients affected with so-called chronic appendicitis are usually suffering from more or less generalized disturbances involving the abdominal wall as well as the digestive tract. The authors describe Carnett's method of demonstrating the parietal localization of pain. In the use of this method they have been surprised to note how many suspected cases of so-called appendicitis were cases of extravisceral disease.

Illustrative cases are reported briefly.

After a review of the literature and of their own observations in a large series of cases, the authors draw the following conclusions:

1. Chronic appendicitis, when considered purely from the clinical standpoint, is not the condition which it is held to be. That it occurs is evidenced by the complete and permanent relief at times afforded by appendectomy.

2. The symptoms produced by so-called chronic appendicitis usually occur as the result of a widespread disturbance involving other abdominal organs besides the appendix or as the result of neuralgia in the abdominal wall. The method of examination advised by Carnett should always be followed in differentiating these conditions.

3. The roentgen-ray signs are usually misleading and difficult to interpret.

4. Individualization is of paramount importance. The diagnosis should be made only after prolonged intensive study and should always be regarded with suspicion unless a history of preceding attacks can be elicited.

L. ENWORTH BOYK, M.D.

Schmieden, V.: Operation for Carcinoma of the Rectum (Zur Problem der Operation des Mastdarmkrebses). *Zentralbl. f. Chir.*, 1931, p. 898.

A strictly radical viewpoint cannot be taken in surgery of the rectum because the resistance of the individual patient must be considered. However, it is technically impossible completely to remove the important chain of lymph glands along the superior hæmorrhoidal artery through a sacral incision. If the general condition will not permit an extensive combined operation even if it is performed in 2 stages, a double-barrelled colostomy is done in the typical manner first and at a second operation the bowel is removed from behind. The lower end of the sigmoid is turned in and sutured into the depths of the wound in order to prevent a sacral fistula. This method, which is called the "posterior invaginating procedure," has been successful in the cases of patients in a very poor general condition.

Of the last 150 cases, ileus occurred in 14 and chronic obstruction in 24. In 66, only a colostomy could be done. A 1-stage extirpation was done in 30 cases, a 2-stage extirpation in 11, a posterior invagination in 19, and resection in 18. A few cases were operated upon atypically. The operation was always begun abdominally.

It is useless to compare the results of various methods as the cases in which they are employed are dissimilar. The best total results will be obtained by the surgeon who can best adapt the treatment to the individual patient. The combined method cannot as yet be considered the normal method. During the same period of time the author performed 41 combined operations and 37 sacral operations.

A. W. FISCHER (Z).

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Dziembowski, S.: Biliary Peritonitis without Perforation (Péritonite biliaire sans perforation). *Bull. et mém. Soc. d. chirurgiens de Par.*, 1931, xviii, 474.

Clairmont and Haberer who, in 1910, first described cases of biliary peritonitis without perforation, believed that the bile invaded the peritoneum by filtering through the wall of the gall bladder which had become dilated as the result of biliary stasis provoked by impermeability of the biliary duct. Some surgeons are of the opinion that the peritonitis is the result of very small perforations which become quickly cicatrized. It has been assumed also that the condition is caused by the rupture, of accessory bile ducts or accessory branches of the bile ducts as the result of stasis. Blad demonstrated that bile is capable of traversing animal mem-

brane which has been exposed to the digestive action of pancreatic ferments. In 1923, Seifert proposed that in all cases of biliary peritonitis without perforation the effusion be examined chemically. In his own cases he demonstrated the presence of diastase. Schoenbauer found trypsin in the bile in biliary peritonitis without perforation. In Bundschuh's case the effusion contained pancreatic ferments.

The author reports a case analogous to those reported by Seifert, Schoenbauer, Bundschuh, and Popper. The principal phenomenon was the appearance of a large quantity of bile in the abdominal cavity in the absence of a communication between the bile ducts and the peritoneal cavity.

This phenomenon can be explained only by the presence of abnormal conditions leading to diffusion of the contents of the bile ducts through their walls. It is evident that a large amount of biliary contents traversed the wall of the gall bladder and the bile ducts because there was a large amount of fluid containing a great deal of bile and because there was no icterus in spite of the biliary stasis. The bile did not penetrate into the blood as a result of the stasis because it was able to leave the obliterated bile ducts by diffusion through their walls. Peritonitis and slight icterus resulted, the latter from absorption of the bile by the peritoneum.

Popper found pancreatic ferments in 20 per cent of cases examined. He was able to demonstrate that in such cases the pancreatic ferments penetrated directly from the pancreatic duct to the bile duct. Their presence in itself is not important. In all of the cases reported by Popper, Bundschuh, and Rupaner and in those seen by the author there was a marked dilatation of the gall bladder and of the biliary tract with considerable tension of their walls. Evidently this was the result of occlusion of the common duct by the stones which were found in the biliary tract.

When the ampulla of Vater is rendered impermeable by the strangulation of a stone, neither the bile nor the ferments coming from the pancreas can penetrate into the duodenum. When the pressure in the pancreatic tract increases as it does during digestion after meals, the pancreatic ferments penetrate into the duct and thus into the bile. The latter then becomes capable of diffusing through the wall of the gall bladder.

In the case reported by Popper and in that reported by the author there were a few lesions of steatonecrosis on the peritoneum around the gall bladder. In Dziembowski's opinion, these were not due to a lesion of the pancreas itself, but were provoked by the action of the contents of the bile duct which contained pancreatic ferments. PACE.

Lewisohn, R.: Hematological Studies as a Basis for Determining the Risk of Postoperative Hemorrhage in Jaundiced Patients. *Ann. Surg.*, 1931, xciv, 80.

The author found that the clotting time and the bleeding time of a jaundiced patient do not always

indicate whether or not postoperative bleeding will occur. A patient with a normal clotting time may suffer from postoperative hemorrhage. The danger of postoperative hemorrhage depends chiefly upon the intensity and the duration of the jaundice. However, the icteric index is of little practical value as a warning of this complication.

Lewisohn has studied the importance of the prothrombin, fibrinogen, and antithrombin tests as indicators of the danger of hemorrhage following operation. He describes the technique of each test in detail. The studies were made in seven surgical cases of deep jaundice and proved of great value in every instance. It was possible to foretell the occurrence of postoperative hemorrhage in every instance in which such bleeding occurred.

The fibrinogen test is not always necessary when the others are employed and has a tendency to rise in the presence of infection, which so frequently accompanies jaundice. The sedimentation rate is valuable. The author proposes its determination with the other clotting tests. He believes that a study of these tests will prove the efficacy of various remedies, such as calcium, glucose, and parathormone, which are now employed in the preoperative preparation of jaundiced patients.

WILLIAM J. PICKETT, M.D.

Grasso, R.: Considerations on a Case of Strawberry Gall Bladder and Interstitial Calculosis (Considerazioni su di un caso di cistifellea a fragola e di calcolosi interstiziale). *Polidiv.*, Rome, 1931, xxxviii, sez. chir. 335.

The author reports the case of a woman fifty-six years of age who was subjected to cholecystectomy for cholecystitis with stone and was found to have a strawberry gall bladder with interstitial calculosis. He believes that strawberry gall bladder is not of inflammatory origin but due to a simple reversible lipoidosis and that intramural calculosis may be a factor in its pathogenesis. EUGENE T. LEDDY, M.D.

Estes, W. L., Jr.: Partial Cholecystectomy. *Arch. Surg.*, 1931, xxiii, 119.

Cholecystectomy is the operation of choice in disease of the gall bladder with or without stones.

In from 25 to 50 per cent of cases, cholecystostomy is only palliative and cholecystectomy becomes necessary later because of persistent infection in the gall bladder with recurrence of symptoms or the formation of stones or a biliary fistula. In the presence of jaundice, cholecystectomy is dangerous because of the likelihood of hemorrhage. In cases, in which drainage of the cystic duct is desirable but a complete cholecystectomy would be dangerous or very difficult, a partial cholecystectomy may be done.

In the technique used by Estes for partial cholecystectomy the gall bladder is exposed by an incision through the upper part of the rectus muscle and carefully surrounded by gauze packs. Its bile and fluid contents are then removed by aspiration. The

fundus is incised and any stones present are removed. The gall bladder is then dried, swabbed out with tincture of iodine, split from the fundus down to the cystic duct, and partially removed by trimming away the redundant part of each half down to the border of the liver. The bleeding from the cut edge is controlled by a ligature or a lock stitch up each side. Two or more cigarette drains are placed close about the cystic duct and brought out against the remnant of the gall bladder. The omentum is carefully tucked in between these drains and the duodenum and the wound then closed.

The author reports seven cases to prove the feasibility of this procedure.

Partial cholecystectomy is not a new operation. In 1899 and again in 1900 W. J. Mayo reported cases of obstruction of the cystic duct in which removal of the stones and of the mucous membrane of the gall bladder was done instead of complete cholecystectomy.

CHARLES F. DU BOIS, M.D.

MISCELLANEOUS

Bettman, R. B., and Hess, J.: **Diaphragmatic Hernia in an Infant.** *Ann. Surg.*, 1931, xciii, 1275.

The authors report a second case in which an infant under one year of age was successfully operated upon for diaphragmatic hernia. The patient was a nine-months-old infant with a congenital diaphragmatic hernia on the left side which became incarcerated. At operation, the hernia was reduced and the diaphragm repaired. The child recovered, and when examined eight months later was apparently cured.

Both an abdominal and an intercostal incision were required for the reduction of the hernia. The abdomen was opened by a muscle-splitting incision

in order to keep the abdominal wall sufficiently strong to withstand the increase of intra-abdominal tension that would result from the reduction of the intestine into the peritoneal cavity. The ribs which formed part of the arc of the diaphragm were fractured to reduce the arc and thus allow a liberal imbrication of the diaphragm. The imbricated portions were scarified to promote the formation of adhesions. The chest was closed without drainage. The atelectatic lung expanded completely within seven days.

Ceccarelli, G.: **The Course of Certain Morbid Conditions in the Abdomen After Section of the Vagus Nerve Beneath the Diaphragm** (*Sul decorso di alcuni stati morbosì della cavità addominale dopo sezione del nervo vago al di sotto del diaframma*). *Ann. ital. di chir.*, 1931, x, 369.

As it has been demonstrated that toxic infectious material may follow the direct perineural lymphatic route in reaching the central nervous system, the author carried out experiments on rabbits in which he sectioned the vagus nerves on both sides below the diaphragm and then, after ten or twelve days, provoked a fatal generalized peritonitis by opening a loop of intestine. He found that the animals treated in this way lived longer than the control animals with intact vagi. It therefore seems apparent that toxic products may pass directly from the abdomen to the medulla oblongata following the vagus nerve. This explains the rapid development of symptoms of the bulbar type seen in peritoneal infection and the special seriousness of peritonitis developing in the upper part of the abdomen. However, in experiments in which the author brought about intestinal occlusion and sectioned the vagi, the animals did not live as long as the controls.

AUDREY G. MORGAN, M.D.

GYNECOLOGY

UTERUS

Corscaden, J. A.: Anatomical Changes Subsequent to the Radiotherapeutic Treatment of Benign Uterine Conditions. *Am. J. Obst. & Gynec.*, 1931, xxii, 74.

The author reports a study made over a period of several years in a series of cases of benign uterine conditions treated with the X-rays and radium to determine the effect of this form of treatment on the size of the myomatous uterus, the importance of X-rays and radium as excitants of latent infections, the frequency and importance of subsequent changes within the tumor, such as degeneration and sarcoma, and the occurrence of carcinoma of the body and neck of the uterus and diseases of the tubes and ovaries, especially conditions which were overlooked at the time the treatment was given and became apparent later. Of 434 women studied, 393 were followed from one to seventeen years, with an average follow-up period of seven years. The findings and the conclusions drawn therefrom are summarized as follows:

- 1 X-ray and radium irradiation are safe treatments for fibromyomata and uterine bleeding.
- 2 The most important factor in the radiotherapeutic treatment of these conditions is accurate diagnosis. When the diagnosis is doubtful, exploration should be done.
- 3 Degeneration in a treated myoma is rare.
- 4 The incidence of tumors of the uterus (sarcoma carcinoma, epithelioma) is unaffected by the artificial menopause.
- 5 The incidence of tumors of the ovary is uninfluenced by the method.
- 6 Cystic changes in the treated ovary occur with much less frequency than in the ovaries of the average woman of the same age.
- 7 Of the cases followed, a reduction in the size of the fibromyoma occurred in 96 per cent, complete disappearance in 55.2 per cent, a reduction of 50 per cent or more in 29.3 per cent, and a definite but small reduction in 12.5 per cent. The large tumors responded less satisfactorily than the small.
- 8 The inflammatory reactions following dilatation and curettage and the introduction of radium seemed to be due more to the operative procedure than to the effect of the electromagnetic waves. In none of the cases was the use of X-rays followed by acute inflammation

E. L. CORNELL, M.D.

Brown, R.: Tuberculosis of the Corpus Uteri Without Involvement of the Endometrium. *Am. J. Obst. & Gynec.*, 1931, xxii, 255.

In the case reported by the author the tuberculous process extended directly from the tubes to the

myometrium by way of the lymphatics apparently without involving the endometrium. It was an incidental finding and not responsible for the symptoms leading to the patient's admission to the hospital. No primary focus could be discovered in the lungs or elsewhere.

E. L. CORNELL, M.D.

Motta, G.: Carcinomata of Mixed Structure and Pavement-Epithelial-Celled Carcinomata of the Body of the Uterus (Sui carcinomi a doppia struttura e sui carcinomi piattoepiteliali del corpo uterino). *Rev. ital. di ginec.*, 1931, xii, 261.

The majority of adenocarcinomata of the body of the uterus with inclusions of pavement epithelial cells present a histological picture intermediate between that of pavement epithelial tissue and that of cylindrical-celled tissue. These may be considered transitional forms. The pavement-cell inclusions are probably due to the direct metaplasia described by Lubarsch. In pyometra it is probable that complete epidermization of the uterine epithelium takes place. This may be considered the protoplasia described by Schridde. When a tumor of the body of the uterus develops primarily as a pavement-cell carcinoma from an epidermized mucosa it is not a metaplasia but a tumor developing directly from a prosoplastic epithelium. No conclusions as to the malignancy of an adenocarcinoma of the body of the uterus can be drawn from the inclusion of pavement epithelial cells.

The author reports six cases of carcinomata of mixed structure.

AUDREY GOSS MORGAN, M.D.

Band, D., and Wade, H.: Vesical Exclusion in the Treatment of Carcinoma of the Cervix Uteri. *Edinburgh M. J.*, 1931, xxxviii, 89.

Band states that a fatal issue in carcinoma of the cervix uteri is generally brought about by an ascending or a blood-borne pyelonephritis, renal suppression, or toxemia resulting from septic absorption.

In involvement of the bladder from anterior extension of a carcinoma of the cervix cystoscopic examination shows the following six stages: (1) elevation of the bladder floor, (2) fixation of the bladder floor revealed by digital manipulation of the cervix, (3) circulatory changes with congestion or petechial hæmorrhage, (4) transverse ridge formation, (5) œdema, and (6) malignant invasion with ulceration, the formation of a hypertrophic nodule, or a vesicovaginal fistula. The changes in the ureteral orifices, in order of increasing gravity, are: (1) fixation, (2) retraction, (3) circulatory changes, (4) irregular gaping, and (5) ulceration and nodule formation from involvement of the ureter by the carcinoma.

The urinary symptoms are never pronounced except in the presence of serious bladder involvement such as ulceration or fistula formation.

In cases treated with radium the general health remained good and the cancer in the cervix itself was eradicated, but the neoplasm persisted in the broad ligament. Under such circumstances involvement of the ureter will undoubtedly occur and lead to death from backward pressure and renal incompetence. Band advises intrasigmoid transplantation of the ureter which will deviate the urine and prevent mechanical interference with urinary function.

Wade states that nephrostomy as a means of permanent drainage is unsatisfactory. Ureterostomy has the advantage that both ureters can be transplanted at one operation. Its disadvantage is the difficulty of collecting the urine as it is voided on the skin surface. The ideal method of vesical exclusion is transplantation of the ureters into the colon. Wade discusses the various operations and recommends the Coffey No. 1 technique.

ROLAND S. CRON, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Meyer, R.: Tissue Anomalies and Their Relationship to Certain Ovarian Neoplasms (Ueber gewebliche Anomalien und ihre Beziehung zu einigen Geschwulsten der Ovarien). *Arch. f. Gynaek.*, 1931, cxlv, 2.

The character of the primary cells of a fully developed neoplasm may often, though not always, be recognized from the similarity of the tumor both in form and function to normal tissues. However, this similarity does not reveal the point of origin of the neoplasm and seldom indicates the grade of differentiation of the tumor germ. The latter very often depend upon faulty development of the tissue or incomplete retrogression of embryonic tissue. They must be sought in apparently normal organs at every age of life, in partly or completely maldeveloped organs, in the normal portions of organs involved by neoplasms, and in the uninvolved organ of bilateral organs one of which is the site of a tumor (particularly when the former is deformed or atrophic). An insight into the histogenesis of the tumors will be gained only by comparing the findings of many such studies with the neoplasms.

Disgerminomata of the testes and ovaries do not arise from the seminiferous tubules and therefore are not seminomata. In the case of ovariogenesis reported by Polano the disgerminoma originated in the ovarian rather than the testicular portion. In some cases of disgerminoma involving one sex gland the other gland is grossly deformed, dysplastic, or aplastic, whereas in others it is well developed and capable of function. For identification of the tumor germs connecting links must be found. The tumor germs are epithelial cells of generative glands which have deviated from the normal and have become incapable of sex function partly because of an intersexual (cytogenous), and partly because of a purely

local, disturbance. Cases of dysplasia or aplasia of the generative glands are cited in which studies for tumor germs were very promising at first but the findings are still difficult to interpret. It is believed that mature follicles of originally normal structure are not the basis of granulosa-cell tumors and that abnormal groups of granulosa cells in the medullary layer in adult ovaries and granulosa-cell tumors in a segmented portion of the ovary are definite evidences of congenital anomalies.

Tubular adenomata of the ovary of a testicular or atypical arrhenoblastoma type are derived from the rete tubules and perhaps also ovarian elements in the medullary canals. Although nothing definite can yet be said regarding the nature of these tumor anlagen, it appears very probable that only an abnormal anlage of these tissues is capable of leading to tumor formation under ordinary constitutional conditions. A zygotic disturbance in the form of a primary ovariogenesis or an abnormally persistent sexual ambogenesis of the indifferent germinal epithelium cannot be excluded. A comparative anatomical study of the entire animal kingdom is necessary to determine the extent to which the rete ovarii and the medullary canals persist and remain capable of proliferating in later years. Tubules resembling the seminiferous tubules are normal components of the ovaries of the cow, and the elements of the male generative glands mentioned are markedly developed in the ovaries of anthropoid apes.

In describing a small ganglioneuroma found in the hilus of the ovary of an old woman, the author calls attention to the fact that some fibromata of the ovary contain groups of epithelioid cells originating from interstitial cells and paraganglia which suggest the origin of fibromata from these parts. Up to the present time no ovarian tumors analogous to the testicular tumors arising from interstitial cells have been recognized, but isolated findings of interstitial-cell proliferation in abnormal ovaries suggest that this phase of the histogenesis of ovarian tumors should be considered in future investigations. The theory that hypernephroid tumors arise from distant cells which become implanted in the ovary itself is supported by embryological studies.

In the study of the histogenesis of tumors the functional effects of the neoplasms on the female organism have recently been found of considerable aid. However they do not help us to determine what tissues constitute the basis of the tumors. The functional properties of the neoplasms show merely that our histological interpretations have been on the right track.

Up to the present time we have been unable by either histological or biological means to determine the stage of differentiation of the primary cells which make up the neoplasms. We have been unable to tell whether the original tumor cells were situated within or outside of the normal tissue network or whether the tissue anomaly which undoubtedly leads to tumor formation at times causes a special indifferent state of the cells or a cellular malformation.

In the literature the erroneous belief is often expressed that the point of origin of a neoplasm may be recognized at any point in the growth. The author states if we were to single out a cavity from a folliculoma or the follicle-like portions of a granulose-cell tumor and designate it as the follicle from which the neoplasm had its origin such reasoning would be incorrect; that if he were to find a follicle with a cumulus proligerus or several primordial follicles in a fully developed tumor he would never conclude that these were concerned in the histogenesis of the tumor. Tumor masses invade not only follicles and corpora lutea, but also corpora albicantia, and no one would designate the corpus albicans as the source of the tumor. In the fully developed tumor it is possible only to compare the completed product with certain tissues histologically and confirm the results of this comparison by studies of biological function. However, from the findings of this investigation no conclusion can be drawn as to the character of the original cells of the tumor or of the tissue. Such a conclusion is warranted only by the finding of proliferation in an early stage.

If one wished to demonstrate the origin of folliculoid neoplasms from an ordinary follicle at any stage of development it would be necessary to use serial sections of an ovary which does not contain a neoplasm. It would be necessary for a follicle otherwise normal in structure to show at one spot an invasion of the deeper structures by the cells of the follicular wall. This phenomenon remains to be demonstrated. It has never come to the author's notice in the course of daily studies, and in his series of thirty-three cases which were reported by Habbe, nothing of this character was demonstrated.

HANS O. NEUMANN (G).

Whitehouse, B.: *The Clinical Aspects of Ovarian Tumors. J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 264.

Whitehouse states that the average age at which benign neoplasms of the ovary occur is forty-two years, and the average age at which carcinoma of the ovary occurs is forty-seven years.

The cases reviewed indicate that ovarian neoplasms are relatively more frequent in unmarried than in married women. Eighty per cent of the women were fertile. Repeated abortion was rare.

The most constant sign of both benign and malignant tumors of the ovary is enlargement of the abdomen. Pain, either unilateral or bilateral, is also common. In cases of malignant tumors, pain is more frequent and more severe and occurs earlier. Loss of weight occurred in 54 per cent of the cases of malignant tumor reviewed by the author and in 14 per cent of those of benign tumor. Bladder symptoms occur occasionally in association with all types of ovarian tumor. About a fourth of the author's patients complained of frequent micturition.

The influence which ovarian tumors exert upon ovulation and the menstrual function is very slight. It is most unusual for ovarian neoplasms to interfere

with ovulation even when both ovaries are involved. Postmenstrual metrostaxis occasionally occurs in cases of benign tumors as well as in those of malignant tumors.

In a series of 250 ovariectomies the mortality was 4.4 per cent. The mortality of hysterectomy is 2 per cent. Ovariectomy is associated with greater risk than hysterectomy for fibroids. This is due to adhesions, the loss of blood, the liberation and absorption of histamine, severe surgical shock, the risk of opening into the lumen of the adherent bowel, and the greater liability of septic infection.

In all cases in which a malignant neoplasm is found, Whitehouse removes both ovaries. He does not approve of partial oophorectomy for localized small simple ovarian neoplasms. He believes that, when possible, it is advisable to remove a cystic tumor without previously diminishing its bulk by tapping.

ROLAND S. CRON, M.D.

Stevens, T. G.: *Ovarian Tumors from the Pathological Aspect. J. Obst. & Gynec. Brit. Emp.*, 1931, xxxviii, 256.

Stevens states that the common tumors of the ovary (cystic adenomata and carcinomata) are essentially growths of columnar epithelium. As there is no columnar epithelium in the adult ovary, he believes that epithelial tumors of the ovary develop in persons who retain a trace of an ovarian tubular system. Multilocular cystic adenomata secrete pseudomucin, and pseudomucin is the normal secretion of the tubular system of the ovary when any part of it persists.

Carcinoma of the ovary sometimes arises from an endometrioma. A papilliferous growth of the ovary which shows malignant characteristics has always been malignant and is not the transformation of a benign growth. The sources of ovarian growths are embryomata or teratomata. The fibroma remains a benign growth as long as it has a fibrillated stroma.

Endothelioma may occur both as a benign and as a malignant growth. The benign form has a plentiful fibrous stroma enclosing masses of cell elements, among which calcareous nodules are often to be seen. These endothelial growths of the ovary sometimes grow to a considerable size and then, unlike the usually smooth fibromata, have an irregular bossy surface. Similar small endothelial growths are found sometimes in the broad ligament apart from the ovary.

Fimbrial cysts have precisely the same characteristics as unilocular and multilocular ovarian cysts. The former contain watery fluid and the latter pseudomucinous fluid. Fimbrial cysts always grow in the edge of the infundibulopelvic ligament, close to the ovary. They are not derived from wolffian remnants.

The most common primary malignant ovarian tumor is the cystic papilliferous carcinoma arising in one ovary and involving the other so rapidly that both ovaries are usually involved however early

operation is performed. Widespread dissemination, especially in the omentum, and ascites are characteristic of these growths. On the other hand, carcinomata of various histological types may be confined to one ovary. The secondary ovarian carcinomata are usually bilateral. Of the secondary ovarian carcinomata, the so-called Krukenberg tumor is unmistakable. Ovarian carcinoma occurs along with columnar-celled carcinoma of the body of the uterus. There is no evidence to show whether the uterine or the ovarian growth was primary.

ROLAND S. CRON, M.D.

MISCELLANEOUS

Stacy, L. J.: Symptoms Following Hysterectomy and Removal of Ovarian Tissue. *Med. Clin. North Am.*, 1937, xv, 61.

The treatment of pelvic diseases not due to a malignant lesion entails always the consideration of 3 factors: the relief of the symptoms of which the patient complains; the removal of diseased tissue or control of the pathological process; and conservation as far as possible, during the reproductive period of life, of the menstrual and child-bearing functions.

This study was undertaken in an endeavor to determine whether the conservation of ovarian tissue at the time of hysterectomy during menstrual life is of advantage to the patient. Questionnaires were sent to a group of women who were subjected to hysterectomy before the age of thirty-eight years previous to 1926. Replies were received from 218.

Of twenty-five women who were thirty years of age or under, the uterus alone had been removed from 19, the uterus and 1 ovary from 2, and the uterus and both ovaries and tubes from 4. Of 193 women between thirty-one and thirty-eight years of age, the uterus alone had been removed from 69, the

uterus and 1 ovary from 77, and the uterus and both ovaries and tubes from 47.

The replies to the questionnaires were studied with regard to the general health and weight nervousness after the operation; the incidence of hot flashes and the approximate time of their onset and duration after the operation; pelvic pain; and the incidence of pelvic operation later. The patients have been grouped according to the type of operation: hysterectomy alone, hysterectomy with removal of 1 ovary, and hysterectomy with removal of both ovaries and tubes.

The author concludes as follows:

1. The general health of patients operated on for pelvic disease during menstrual life is better after the operation if one or both ovaries are saved.

2. Nervousness is increased or develops in a larger percentage of cases if both ovaries have been removed, and the younger the patients are at the time of operation the higher is the incidence of increased nervousness. The incidence of hot flashes is also increased in cases in which both ovaries have been removed.

3. The function of the ovaries apparently continues for some time after removal of the uterus, as the majority of the patients who became nervous or had increased nervousness after operation noted the change several years afterward and in most of those who had both ovaries removed the hot flashes began soon after the operation.

4. Pain occurs less commonly if both tubes and ovaries are removed.

5. Ovaries not removed at the time of the removal of the uterus seldom necessitate a subsequent operation.

6. Except in cases of malignancy, the treatment of pelvic disease in young women should be as conservative as possible.

PREGNANCY AND ITS COMPLICATIONS

Muller, G., and Oberling, C.: Some Cases of Ectopic Pregnancy. Intra-peritoneal Haemorrhage of Genital Origin (A propos de quelques cas de grossesse ectopique et d'inondation intrapéritoneale d'origine génitale). *Gynec. et obst.*, 1931, xxiii, 482.

In recent years there has been a decided increase in the incidence of ectopic pregnancy. Authorities differ widely as to the cause. Some attribute the greater incidence of the condition to the continued spread of gonorrhoeal infection that has occurred since the war. Others believe that gonorrhoea is a negligible factor. As only 23 per cent of the cases reviewed by Tschertok appeared to be due to pelvic infection and as a large percentage of the tubes removed show no histological evidence of a previous inflammatory lesion, the authors believe that pelvic infection is of less importance than other factors.

In the diagnosis of ectopic pregnancy many errors are made even when the signs and symptoms are characteristic. Atypical cases are quite common. Recently the authors encountered a series of cases illustrating the difficulties in the diagnosis, particularly of the complications and sequelae. They discuss the difficulties encountered in cases of tubal abortion, tubal rupture, and intra-peritoneal haemorrhage due to genital causes other than ectopic pregnancy.

Expulsion of the decidua often suggests to the physician simple abortion. The pain and bleeding continue, and attempts at curettage may result in disaster. The authors report a case in which, three weeks after an abnormally short menstrual period, the patient was seized with pain in the lower part of the abdomen and bleeding. Curettage attempted by the attending physician at the end of ten days resulted in perforation of the uterus. Laparotomy was then performed and a large collection of blood removed together with a tubal pregnancy.

Secondary infection of a pelvic hæmatocele is quite rare. The organisms may reach the hæmatocele through the blood or lymph, by direct extension from an indamed tube or from the wall of the adjacent intestine.

The authors report two cases in which an infected encysted blood clot was found. In both, the source of the infection was an acutely inflamed tube. In one case the correct diagnosis was suggested by the history, symptoms typical of ectopic pregnancy were followed after an interval by symptoms of pelvic suppuration.

Torsion of a tubal pregnancy is extremely rare. In a case cited by the authors, operation was performed for a supposed twisted ovarian cyst. The ampulla of the tube was found to form a blood-filled

pouch. The ovary presented a corpus luteum of pregnancy. The pedicle, the uterine end of the tube, was twisted two and a half times.

Bilateral tubal pregnancy sometimes occurs and the ova may be of different ages. Hence bilateral tubal lesions do not always signify inflammatory disease. The authors report a case of bilateral tubal pregnancy occurring in a woman suffering from active pulmonary tuberculosis.

Ectopic pregnancy as a cause of ileus was reported long ago by Pinard. In a case cited by the authors, the patient had passed through an attack of acute abdominal pain with metrorrhagia six weeks after the last menstrual period. In the twelfth week the symptoms and signs of acute intestinal obstruction appeared. At operation, a loop of small bowel was found adherent to a large mass in the right adnexa. The loop was resected. Histological examination showed the tumor to be an organizing hæmatoma. The intestinal wall was invaded by chorionic cells and was acutely inflamed.

In ruptured tubal pregnancy the symptoms are not limited to the pelvis. Tumor and metrorrhagia are usually absent. The symptoms may suggest perforation of a viscus. Muscular rigidity is usually very moderate, but in some cases may be extreme. Urinary retention or anuria sometimes occurs, as in one of the authors' cases, and indicates an unfavorable prognosis. The pallor, rapid pulse, and agitation may be duplicated by peritonitis. The authors report a case of ruptured pyosalpinx which exactly reproduced the syndrome of internal hæmorrhage.

Pelvic hæmatocele from reflux of blood from the uterus may follow a simple abortion. In a case seen by the authors the patient continued to bleed after an abortion in the fourth month. Bimanual examination revealed a large uterus and a firm tumor the size of an apple in the posterior uterine wall. At operation, 300 c. cm. of blood were removed from the cul-de-sac and, because of the fibroid, a panhysterectomy was done. Pathological examination revealed a placental polyp at the site of the fibroid. The uterine obstruction had evidently caused blood to escape through the tube into the peritoneal cavity.

In discussing various diagnostic tests the authors advocate the injection of pituitrin. Failure of such an injection to arrest uterine hæmorrhage suggests some condition other than uterine pregnancy. The Aschheim-Zondek test is of value, but may be positive in the presence of other pelvic conditions. Diagnostic puncture of the cul-de-sac is regarded by the authors as justifiable.

In conclusion the authors advocate immediate operation when the symptoms suggest ectopic pregnancy.

ALBERT F. DE GROOT, M.D.

Mitra, S.: *Anæmia of Pregnancy*. *Indian Med. Gaz.*, 1931, lxvi, 363.

Anæmia of pregnancy is aplastic and differs from pernicious anæmia in that it occurs only with pregnancy and terminates with delivery, undergoes no marked remissions or exacerbations, is of much shorter duration, and occurs earlier in life, being most frequent at the age of twenty-five years and rare before the age of fifteen and above the age of forty years.

Of the 86 cases reviewed by the author, 76 per cent were those of multiparæ with no previous history of anæmia. A seasonal variation in the incidence of the condition was noted, more cases being seen in the second half than in the first half of the year. There seemed to be a direct relation between the anæmia and gastro-intestinal disturbances. The anæmia developed most frequently between the sixth and eighth months of pregnancy.

The onset of the condition is insidious and characterized by dyspnœa on slight exertion, puffiness of the face, a blanched appearance, and occasionally fever. Diarrhœa occurred in 44 per cent of the cases reviewed and soreness of the mouth was present in 82 per cent. Oedema of the face and lower extremities occurred in 79 per cent. The urine was generally scanty and the blood pressure low.

The blood showed a color index of 1.35. The average hæmoglobin value was 28.4 per cent. The red cell count was above 2,000,000 in only 6.3 per cent of the cases. A tendency toward leucocytosis was noted. Anisocytes were almost always present, and normoblasts were common.

Most of the patients did not come under observation until the disease had been present for from four to six weeks. Death or cure resulted in eleven or twelve days. Labor was usually premature, and the incidence of postpartum hæmorrhage and morbidity was increased. The maternal mortality was 29 per cent. There seemed to be a definite relation between oedema and a favorable prognosis. In cases with diarrhœa the mortality was increased. The fetal mortality was 52.8 per cent.

The pathological changes were most marked in the liver, which was large, pale, and friable. The other changes were those of an aplastic anæmia.

The author discusses the question as to whether the condition is a primary disease due to pregnancy or a secondary disease associated with the pregnant state and aggravated by it. It has been ascribed to malaria, kala-azar, dysentery, hookworm disease, sprue, syphilis, and infection from the bowels, bladder, and genital tract. Because of the changes in the liver, the theory attributing it to a toxæmia of pregnancy has been favored. It is possible that a toxin is formed in the placenta.

The treatment must be largely palliative and symptomatic until a considerable portion of the puerperium has passed. Iron, arsenic, calcium, and whole blood have been given intramuscularly. Adrenalin is used to maintain the tonicity of the cardiac muscle. Deep X-ray therapy to the liver, the spleen,

and the heads of the long bones has been given to stimulate the reticulo-endothelial system which is the site of formation of various protective antistances. Reticulo-endothelial tissue can give rise to all types of blood cells. X-ray irradiation stimulates also the erythropoietic system.

Artificial termination of the pregnancy has been considered because the results are not absolute until delivery. However, spontaneous termination is more desirable.

In conclusion, Mitra states that, in India, anæmia of pregnancy is common and has a high fetal and maternal mortality. He believes it may be considered a toxæmia of pregnancy.

DONALD G. TOLLEFSON, M.D.

Dogliotti, V.: *Intravenous Pyelo-Ureterography in Pregnancy* (Pieloureterografia endovenosa in gravidanza). *Riv. ital. di ginec.*, 1931, xii, 301.

Pyelography was formerly practiced by the ascending route. In 1929, Lichtenberg and Swick reported eighty-four cases in which they used intravenous injections of uroselectan, a pyridin derivative containing 42 per cent organic iodine. The author reviews the literature on uroselectan in pyelography and reports twelve cases in which he employed it during pregnancy. The case reports are supplemented by roentgenograms. The examinations were made in various stages of pregnancy. The solution used consisted of 30 gm. of uroselectan dissolved in 100 c. cm. of double distilled water. The injections were given very slowly. There were no unfavorable effects. Chills and tremor occurred in only one case; they lasted for about fifteen minutes. In all of the cases there was a marked increase of diuresis for twenty-four hours. The renal pelvis and ureters became visible within a few minutes and remained visible for two or three hours.

As a rule the changes in the genito-urinary tract became more marked as pregnancy advanced. In most of the cases the kidney shadow was normal in position and size. Ptosis was noted only in the cases of two multiparæ. However, the examinations were made with the patients lying down, and ptosis is more marked when the patient is standing. In most of the cases of pregnancy beyond the fourth month there was dilatation of the pelvis. This was more marked on the right side than on the left side. In some of the cases of pregnancy in the ninth month there was marked dilatation of the calyces.

The lumbar part of the ureters was well injected whereas the pelvic part was visible in only one case. In the latter, a case of pregnancy in the fourth month, the left pelvic ureter showed a curve with the convexity outward just above its entrance into the bladder. A marked difference in the course of the ureter was noted not only in the different cases, but also in the same case at different examinations. The changes in the same individual were probably due to movements of the fetus and differences in the contents of the abdominal organs. In some cases the course of the ureters was almost straight, where-

as in others it was tortuous. In some cases dilatation of the ureters was noted. This was more marked on the right than on the left side. In some cases there were kinks of the ureter. Some of the kinks were almost right-angled bends, whereas others were only slight bends. Generally the most marked bends were in the upper end of the right ureter. There was never marked dilatation above the bend with dilatation below; the caliber of the ureter was unchanged. The kinks also varied at different examinations of the same patient. They never interfered with the passage of the opaque medium. They were probably due to elongation of the ureter brought about by hypotonia of the musculature with dominance of the sympathetic and by a disequilibrium of calcium and potassium ions with dominance of the potassium ions.

The lordosis of pregnancy probably exerts traction and pressure on the ureter. In two cases of pyelitis of pregnancy the roentgen changes were no more marked than in some of the cases without clinical symptoms. In the former, the uroselectan seemed to have a therapeutic action. This was probably due partly to its moderate germicidal effect and partly to the increased diuresis it brought about.

AUDREY GOSS MORGAN, M.D.

LABOR AND ITS COMPLICATIONS

Audebert, J. L.: *Tumor Prævia* (Les tumeurs prævia) *Rev. franç. gynec. et obst.*, 1931, xxvi, 318.

Tumor prævia is defined as a pathological mass located in the path of the fetus and obstructing labor. Frequently it is associated with edema of inflammatory origin which constitutes an additional obstruction to labor.

The tumor may be of uterine or adnexal origin, or may arise from the pelvis, the vagina, or the vulva.

The uterine tumors necessarily develop in the lower segment of the uterus. Of these, cancer of the cervix is the most formidable. More common are fibroids of the cervix. These are capable of undergoing changes favorable to labor. As much of their bulk is due to edema and hyperemia, the pressure of the fetal head may reduce their size sufficiently to permit spontaneous delivery. Moreover, these tumors often pass from the birth canal into the abdomen during labor.

Occasionally an elongated and hypertrophied cervix increases in size under the influence of pregnancy to such a degree that it forms a tumor of formidable proportions. The author cites a case in which a low cesarean section was necessary.

Of the adnexal tumors, ovarian cysts most frequently interfere with labor. The dermoids are especially dangerous because of their tendency to become fixed in the cul-de-sac. Unlike fibroids which are incorporated in the uterine musculature, dermoids have no tendency to ascend into the abdomen. Also by virtue of fixation, cysts of the broad ligament inevitably offer an obstacle to the descent of the fetus.

Of the pelvic tumors, hydatid cysts are clinical curiosities. They have been reported by Dambria and Bar. Cancer of the rectum, osteosarcoma, and pure vaginal fibroma are also extremely rare. The author cites a case of cancer of the vagina which prevented delivery. Another rare tumor obstructing labor is hematoma of the vagina and vulva due to the rupture of a varix.

In some cases of tumor prævia spontaneous labor is possible in spite of the tumor. In others, operative delivery is necessary and if the diagnosis is made early the intervention may be carried out at the most opportune time. Low cesarean section is most frequently indicated. In a third group of cases labor is allowed to proceed because the obstacle is not recognized and grave and often fatal complications such as infection or rupture of the uterus result. In these cases death of the fetus is almost inevitable because of prolapse of the cord.

It is a simple matter to diagnose the presence of the tumor, but often difficult to determine its nature. As a rule, however, it is enough to know whether or not spontaneous delivery is possible. When a tumor the size of a hen's egg is located laterally it does not offer a serious obstacle to the fetal head, but when it arises from the cervix or the lower segment of the uterus it may constitute an absolute obstruction. Other factors to be considered besides its location are its consistency and mobility.

Delivery is often possible through even an advanced carcinoma of the cervix, but because of the nature of this lesion it is not desirable. Cesarean section should be done before the onset of labor.

Most difficult to determine is the course to follow in the presence of a fibroid. While many fibroids will be drawn into the abdomen under the influence of labor, the obstetrician cannot count on this. The author believes that a test of labor for a period not exceeding four hours is permissible. He cites a case in which displacement of the tumor toward the superior strait became evident with the first uterine contractions. A favorable prognosis was made and justified by the occurrence of spontaneous delivery. Under other circumstances cesarean section would have been indicated.

The problem of the treatment of tumor prævia is largely solved by the low cesarean section. The disposal of the tumor is of secondary importance to delivery of the fetus, and the decision as to whether the neoplasm should be extirpated immediately or later must be based on the conditions in the particular case. The author believes that in cases of cervical cancer radium irradiation is preferable to hysterectomy.

ALBERT F. DE GRAAT, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Williams, J. W.: *Disappearance of the Placental Site During the Puerperium*. *J. Am. M. Ass.*, 1931, xcvi, 523.

This study of the placental site was made on: (1) uteri removed by supravaginal hysterectomy follow-

ing cesarean section or removed for other reasons during the first few days of the puerperium, (2) uteri removed at autopsy on women dying from causes other than infection during the first week of the puerperium, and (3) uteri removed from uninfected women between the seventh and the one hundred and twentieth day after delivery.

In a small proportion of the uteri removed at cesarean section the placenta remained *in situ*, but in the majority it had been expelled spontaneously or removed artificially before the uterus was amputated. In most of the latter the placental site could not be identified until histological examination demonstrated the presence of chorionic giant cells in the decidua basalis and underlying musculature. Within a few hours after delivery the conditions changed radically. In a uterus removed three-quarters of an hour after delivery the greater part of the decidua basalis consisted of large vessels distended with blood and separated from one another by a minimal amount of tissue. Thereafter, the placental site consisted of an aggregation of obliterated arteries and thrombosed veins. The latter tended to become organized by the invasion of fibroblasts and the intervening tissue tended to undergo hyalin change.

The author's explanation for the transformation into a well-developed placental site is as follows:

Immediately after the extrusion of the placenta the uterine musculature contracts to its maximum extent so that the vessels throughout its wall are forcibly compressed and the relatively large, thin-walled venous sinuses in the decidua basalis collapse completely. Shortly thereafter, the uterus relaxes to a certain extent. The circulation in the thick-walled arteries is then partially resumed, but the thin-walled veins throughout the muscularis remain compressed. Consequently, the blood which gains access to the uterus but finds difficulty in escaping from it collects in the veins of the basalis and leads to their distention and engorgement. In a short time equilibrium becomes established and, the venous contents at the placental site having already become thrombosed, the characteristic nodular structure is produced. From this time onward the placental site gradually becomes smaller. During the course of the seventh week after delivery it disappears.

Outside of the placental site the superficial portion of the decidua vera, which is left *in situ* after the separation of the membranes, becomes infiltrated with leucocytes, undergoes necrotic changes, and is cast off with the lochia. A new mucosa is regenerated from the fundi of the glands which remain.

At the placental site, conditions are much more complicated. Here there is but little infiltration with leucocytes and very little necrosis, and the disappearance of the site is effected by a process of exfoliation lasting for six or seven weeks, during which time tissue is cast off into the uterine cavity.

The vessels at the placental site occupy not only the remnant of the decidua basalis, but also a portion of the muscularis immediately beneath it. As

a result, at least some of the basalis glands come to lie internal to some of the thrombosed vessels. Regeneration occurs by an undermining of the placental site by strands of endometrium growing in from the margins and eventually leading to its exfoliation.

As the puerperium advances the placental site constantly becomes smaller and loses its blood-stained appearance. The evidence indicates that the process is in no way connected with an inflammatory change and that there is no extensive necrosis. An unusual proliferation of endometrial tissue not only covers the surface, but invades the placental site in all directions and particularly extends between it and the underlying muscularis, leading to its undermining and eventual extrusion or exfoliation.

The occurrence of exfoliation is evidenced by the fact that tissue of various kinds can be found free in the uterine cavity throughout the entire course of the puerperium, that is, up to the end of the seventh week. Such tissue may consist of shreds of necrotic mucosa, particles of tissue which can be identified as obliterated or hyalin vessels, particles of hyalin tissue containing fragments of endometrium, fragments of completely regenerated endometrium, and polypoid masses of tissue in the process of extrusion.

Without such exfoliation great difficulty might be experienced in getting rid of the obliterated arteries and thrombosed vessels. If these remained *in situ* a considerable part of the mucosa would soon become converted into a mass of dense scar tissue, with the result that after a few pregnancies it would no longer be able to go through its usual cycle of changes and reproduction would come to an untimely end.

The author regards the obliterated arteries at the placental site as the peripheral ends of vessels which present similar changes in other parts of the uterine wall. These terminal ends are cast off with the placental site while the distal portions remain *in situ* and present the characteristic picture which is designated by some as sclerosis. Certain of these vessels are doubtless replaced by smaller ones and others become obliterated and completely absorbed, but in many women large numbers persist for the rest of life and afford a means of diagnosing the occurrence of previous pregnancies.

DONALD G. TOLLEFSON, M.D.

NEWBORN

Anselmino, K. J., and Hoffmann, F.: The Causes of Icterus Neonatorum (Die Ursachen des Icterus neonatorum). *Arch. f. Gynaek.*, 1931, cxliii, 477.

Up to this time attempts to explain the differences between the fetal and maternal blood systems have been unsuccessful. In the discussions, icterus neonatorum has always been especially considered.

The authors believe that icterus neonatorum is the result of deficient oxygenation of the fetal blood through the placenta and have therefore made extensive investigations of the oxygen content of the fetal blood. The oxygen saturation of the maternal arte-

rial blood was found to be 95 per cent, whereas that of the arterialized blood in the umbilical cord was scarcely 20 per cent. These figures indicate that the oxygenation of the fetal hæmoglobin in the placenta is inadequate and that the fetal organism is in a state of extreme oxygen deficiency. The causes of this deficiency are the relatively meager respiratory surface and the unfavorable oxygen concentration, as was definitely established by the studies of Haselhorst and Stromberger. The fetus exists under circumstances similar to those of persons living in high altitudes (mountain sickness). However, the oxygen concentration of the blood of mountain climbers is much better, even at very high altitudes, than that of the fetal blood stream.

The result of oxygen deficiency is a sequence of characteristic symptoms which are designated as acclimatization symptoms—an increase in the pulse rate, hæmoglobin content, erythrocyte count, blood volume, glutathione content, catalase content, and the oxygen dissociation curve of the fetal hæmoglobin. All of these changes enable the body to improve its oxygen intake. In mountain sickness there is a definite increase in the heart weight, the pulse rate, the number of erythrocytes, and the hæmoglobin content. The increased blood volume in the newborn amounts to more than 12 per cent of the body weight. Glutathione is a sulphur-containing amino acid complex and serves, next to the hæmoglobin, as an oxygen carrier. The average glutathione content of the umbilical cord blood is 40 per cent higher than that of the maternal blood. The catalase content is also increased. The dissociation curve of

the fetal hæmoglobin shows changes similar to those occurring at high altitudes.

At the moment of birth a fundamental change takes place in the conditions of the blood and the circulation of the fetus. The entire compensation mechanism becomes superfluous and in place of "acclimatization" there is a "re-acclimatization" to normal conditions. Important retrogressive changes take place especially in the hæmoglobin. Icterus neonatorum, just as any icterus, is explained on the basis of an increase in the bilirubin content of the blood. In searching for the cause of the increased bilirubin content of umbilical cord blood, the authors found that in the presence of a high hæmoglobin content and an increased amount of transformed hæmoglobin the amount of bilirubin is increased many times. Shortly after birth the bilirubin content increases still more because the previously increased amount of hæmoglobin has become superfluous and the excess is reduced to bilirubin. This process is completed in about fourteen days.

In conclusion the authors discuss the question as to why all newborn infants do not become icteric. This is explained by two factors: the amount of bile pigment contained in the blood plasma, and the state of the cutaneous capillaries. It is known that even when the bilirubin content of the blood is the same, the intensity of icterus often varies greatly. In their studies with histamin, the authors were able to prove the existence of an increased permeability of the capillary endothelium. In premature infants, this is especially marked and always leads to icterus.

KESSLER (G).

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Hellström, J.: The Practical Value of the Intravenous Indigocarmine Test (Ueber den praktischen Wert der intravenösen Indigokarminprobe). *Acta chirurg. Scand.*, 1937, lxxviii, 225.

The indigocarmine test can be used either for chromocystoscopy or in connection with ureteral catheterization. The author reviews the advantages and disadvantages of each method. He has usually employed the latter as it seems to him to be a better procedure than the former for the determination of the onset of the pigment excretion, the difference in pigment excretion on the two sides, and the quantity of excreted urine, which is of great importance in the outcome of the test. The results are influenced by a number of factors, which the author classifies as prerenal, renal, and postrenal and discusses in detail. Following a review of the conditions favorable or unfavorable to the introduction of indigocarmine by intramuscular or intravenous injection, Hellström arrives at the conclusion that the intravenous injection is the more satisfactory procedure and is associated with no greater risk than intramuscular injection. He has employed the intravenous method in about 300 cases.

The 276 cases on which this report is based are divided into 5 groups according to the outcome of the test: (1) normal (blue discoloration within five minutes); (2) elimination slightly delayed (from five to seven minutes), coloration normal; (3) time of elimination normal, coloration reduced; (4) elimination slightly delayed (from five to seven minutes), coloration reduced; and (5) elimination greatly delayed (over seven minutes).

The practical importance of the intravenous indigocarmine test is discussed with regard to: (1) the establishment of the presence of a functionally sound kidney when nephrectomy on the other side is contemplated; (2) the determination of whether the function of a kidney is so poor that it is valueless to the organism; (3) the differential diagnosis between pyelitis and pyelonephritis; (4) the determination, in obscure cases, of the presence or absence of kidney disease; and (5) the diagnosis of early impairment of function. The author arrives at the following conclusions:

The intravenous indigocarmine test is free from danger. For a correct estimate of the test it is necessary to consider a number of factors which influence its outcome. A normal indigocarmine test does not exclude a diseased kidney, but delayed or reduced coloration indicates the presence of renal disease with great constancy. The intravenous indigocarmine test may be of importance for diagnosis, prognosis, and therapy.

Draper, W. B., Darley, W., and Harvey, J. L.: The Effect of Pituitary Extract upon the Tonus of the Human Pelvis and Ureter and Its Possible Application in the Therapeutics of Pyelitis and Related Conditions. *J. Urol.*, 1931, xxvi, 1.

The authors report a study of the effect of pituitary extract on the contraction of the renal pelvis and the ureter and report a case of hydronephrosis and hydro-ureter treated with pituitary extract.

Miller and Ginsberg found pituitary extract useful in the treatment of pyelitis because of its power to accelerate drainage by increasing the tone of the renal pelvis and ureter. Intravenous urography constitutes a simple method by which the response of the urinary tract to preparations of the posterior lobe of the pituitary gland may be studied. As a certain degree of bladder tension facilitates visualization, the authors injected the opaque medium when the bladder was moderately distended by a two-hour collection of urine. The opaque medium was given intravenously—uroselectan by the technique of Swick, and skiodan as recommended by the manufacturers. From 0.1 to 1.0 c.c.m. of pituitary extract was injected intramuscularly. Roentgenograms were made fifteen minutes after the administration of the contrast agent and three, seven, fifteen, and thirty minutes after the injection of the pituitary extract.

The influence of pituitary extract upon the diuresis induced by an intravenous injection of uroselectan was studied on a dog with a bladder fistula. Each injection consisted of 4 gm. of uroselectan in 11 c.c.m. of water per kilogram of body weight. After the diuresis had been established for ten minutes, from 0.1 to 0.5 c.c.m. of pituitary extract was given intramuscularly. Readings of the urinary output were made every five minutes.

The authors conclude that the disappearance of the shadows of the renal pelvis and the ureter following the administration of the pituitary extract could not have been due to the inhibition of urinary secretion. They found that uroselectan causes an immediate diuresis, but that the secretion of urine returns to almost a normal level in from thirty to thirty-five minutes. Their results yielded no evidence that pituitrin or "pitressin" has sufficient antidiuretic action to account for the disappearance of the shadows of the renal pelvis and the ureter. Therefore they conclude that the disappearance of the shadows is due to active peristalsis or spasm.

The case of hydronephrosis and hydro-ureter reported by the authors was that of a man aged thirty years who was first admitted to the Colorado General Hospital on May 5, 1928, with a compression fracture of the twelfth dorsal vertebra. During the following two years he recovered sufficiently to

go about on crutches. When he was seen by the authors he had had an indwelling catheter for some time, suffered from constant dribbling of urine, and gave a history of acute attacks of fever and chills and pain in the upper abdomen so severe as to require large doses of morphine. The fever lasted for from five to twelve days, confined him to bed, and recurred every second day. The urine contained pus cells, blood cells, and albumin and on culture yielded paratyphoid bacilli. Intravenous urography showed bilateral hydronephrosis and hydro-ureter with elongation and kinking of the ureters. As forced fluids and urinary antiseptics failed to give relief, the intramuscular injection of pituitary extract was tried. The pain was at once relieved and the attacks became shorter, less severe, and less frequent. After ten days they ceased and have not since recurred. The authors believe that in this case the pituitrin caused sufficient peristalsis of the renal pelvis and the ureters to exert a favorable influence on the pyelitis. They draw the following conclusions.

1. Intramuscular injections of pituitary extract and "pitressin" reduce the size and the density of the shadows of the renal pelvis and the ureter shown on intravenous urography. The change is more pronounced the larger the dosage. When the maximum dose of 15 minims is given a marked diminution in the size and density of the shadows occurs from three to seven minutes after the injection.

2. Since neither pituitary extract nor "pitressin" injected intramuscularly produces an antidiuresis in the presence of a diuresis previously induced by the intravenous administration of uroselectan, the diminution in the shadows is probably due to acceleration of drainage by active ureteral and pelvic peristalsis and not to antidiuresis.

3. In the clinical case of pyelitis reported, marked relief of pain followed the exhibition of pituitary extract. In this respect the extract was much more efficient than $\frac{1}{8}$ gr. of morphine.

4. It must be admitted that the therapeutic value of pituitary extract in pyelitis and related conditions of the urinary tract is an open question. However, the results in the reported case of pyelitis with bilateral hydronephrosis and hydro-ureter are suggestive. It is possible that the clinical improvement noted was due in part to changes in the composition of the urine brought about by the administration of pituitrin. CLAUDE D. HOLMES, M.D.

Van Caulaert, C., and Pétrequin, P. S.: A Study of the Physiopathology, Pathogenesis, and Therapeutics of Chloride Deficiency Appearing in the Course of Nephritis with Anuria or Oliguria (Étude physio-pathologique, pathogénique et thérapeutique de l'hypochlorémie apparaissant au cours des néphrites sèches avec anurie ou avec oligurie). *Arch. d. med. d. reins et d. organes génito-urinaires*, 1931, vi, 52.

The existence of hypochloræmia in the course of certain types of nephritis has been well established.

In 1928 the authors reported on the occurrence in nephritis of a diminution of the chlorides and the development of a uræmic syndrome which was best treated by the administration of chlorides.

In this article the authors report the results of experimental studies on dogs with anuria and similar studies on human beings suffering from various types of anuria, both secretory and excretory. They studied simultaneously the urea of the blood; the chlorides of the plasma, the spinal fluid, and the tissues; the alkali reserve; and the output of urine.

They found that in both the dog and man there are two stages in the physiopathology of the chlorides in nephritis with anuria or oliguria, the first stage, before the onset of vomiting, there is a hypochloræmia caused by redistribution of the chlorides which leave the plasma and enter the tissues. In the second stage, which occurs after the onset of vomiting and diuresis, there is a hypochloræmia associated with a loss of chlorides from the tissues by vomiting and diuresis. In the latter stage there is a tendency for the blood urea to rise even after the onset of diuresis and death may result from this cause alone. This terminal uræmia may occur even after the kidney inflammation shows a tendency to retrogress and is a direct result of the loss of chlorides by vomiting and diuresis.

The authors have demonstrated that hypochloræmia is a constant finding in cases of anuria. In discussing the pathogenesis they state that uræmia is associated with a molecular concentration of the blood and a disturbance of the acid-base equilibrium of the blood on the side of acidosis. They have been able to reproduce the fluctuation in the chloride content experimentally by administering a sufficient quantity of a 1 to 5 per cent aqueous solution of lactic acid. Thus they have demonstrated that acidosis may produce this fluctuation in the distribution of the chlorides. They point out also that frequent vomiting is associated with a loss of chlorides from the tissues and leads to a deficiency of chloride which is readily corrected by the subcutaneous administration of normal saline solution and the intravenous administration of hypertonic saline solution.

In discussing the treatment of anuria the authors state that the increase in the molecular concentration of the blood should be combated by the administration of large amounts of fluid by mouth, subcutaneously, and by rectum, and that the acidosis should be corrected by giving sodium bicarbonate by mouth, by stomach tube, by duodenal sound, by rectum, or intravenously in the form of a hypertonic solution (30 to 50 per cent) as in the treatment of diabetic coma. Edema following such treatment is favorable as it means dilution of the toxins.

The treatment of the deficiency in chlorides is discussed in detail. It is stated that during the first stage when there is a shift to the tissues the administration of chlorides is harmful. It is indicated only in the second stage when there is an excessive loss of chlorides due to vomiting and diuresis. In the

latter case, chlorides should be given by mouth, subcutaneously (1 to 2 liters of normal saline solution daily), by rectum, and intravenously. The intravenous injection of hypertonic glucose is harmful as it increases the molecular concentration of the blood; in experiments it has resulted in pulmonary edema. Diuretics are contra-indicated as the kidney should be placed at rest. The use of cardiac stimulants is advised.

JACOB E. KLEIN, M.D.

MacKenzie, D. W., and Hawthorne, A. B.: Hæmangioma of the Kidney. A Report of Two Cases and a Brief Résumé of the Literature. *J. Urol.*, 1931, xxvi, 205.

Hæmangioma of the kidney, while exceedingly rare and classed as benign, frequently require immediate radical treatment. They may occur in the renal pelvis, cortex, or medulla. As a rule they are single. The clinical symptoms—colicky pain, marked anæmia, and possibly shock and collapse—are due solely to hæmorrhage resulting from ulceration of the thin-walled vessels in the pelvis.

The treatment has varied. Some cases have been treated symptomatically and others by nephrotomy and decapsulation, but in twenty-three of the twenty-five reported cases nephrectomy was done eventually.

HARRY W. FLAGGMEYER, M.D.

BLADDER, URETHRA, AND PENIS

Cunningham, J. H.: Tumors of the Bladder. *J. Urol.*, 1931, xxv, 559.

The last sentence of the paragraph appearing at the top of the second column on page 466 (November, 1931, issue) should read: "In 31 advanced cases in which Beer used Barringer's method, there were 11 deaths."

Dean, A. L., Jr., and Quimby, E. H.: Radiation Therapy of Carcinoma of the Bladder. *Surg., Gynec. & Obst.*, 1931, lili, 89.

In 106 mixed cases of papillomatous and infiltrating carcinomata of the bladder the authors obtained very favorable results by interstitial radium irradiation with from 20 to 25 threshold erythema doses throughout the involved area and the surrounding healthy tissue. Uniformity of tissue doses is best obtained by using a large number of doses distributed evenly and closely throughout the area rather than more widely distributed large doses. In treating carcinoma an equitable distribution of this tissue dose is of more importance than the total number of millicuries used.

GILBERT J. THOMAS, M.D.

GENITAL ORGANS

Retterer, E.: The Action of the Genital Glands and the Interaction of the Organs (De l'action des glands génitaux et de l'interaction des organes). *J. d'urolog. méd. et chir.*, 1931, xxxi, 537.

The author discards all of the special designations for hypothetical substances and influences such as

"hormones," "hormozones," and "endocrines," and designates the effects of the genital glands merely by the terms "external action" and "internal action." For the effects which are more regulatory than differentiative he uses the term "interaction of organs."

The external action of the ovaries and testicles is, of course, the elaboration respectively of the ovum and the spermatoid and the formation of a new individual from their union. Their internal action, on the other hand, is manifold and variable. The author rejects the theory of an interstitial gland. He ascribes the internal action of the testicle to the absorption of the products of dissolution or liquefaction of the epithelial cells of the convoluted tubules and that of the ovary to the liquor folliculi. During the reproductive period of life and the rutting or breeding season the heightened exchange of these products with the rest of the body, intensified in turn by the interaction of other influences such as sight, smell, and climatic and nutritional conditions, results in a heightened differentiation of the male from the female (the female being regarded as the more primitive) or vice versa. Also during this period or season there is an increase of physical, sensory, and cerebral activity. Rejuvenescence in the multicellular organism is ascribed by the author to the exchange of substances between the sex glands and the other organs of the body. In the ciliated infusoria rejuvenation of the process of direct fission is accomplished by an occasional copulation in which the two organisms adhere by their mouths and each gives to the other, by nuclear division, one-half of its smaller nucleus.

There are two apparent exceptions to this theory which the author finds difficulty in explaining. The first is the tendency toward masculinity of many females after the menopause (growth of hair on the chin, deepening of the voice). Retterer ascribes this tendency to the effect of the cessation of the other sexual functions. The other exception is the apparently superior intelligence of the worker ant whose sexual organs (ovaries) are rudimentary.

JOHN W. BRENNAN, M.D.

Swan, C. S., and Mintz, E. R.: A Review of the Prostatectomies for Benign Prostatic Hypertrophy at the Massachusetts General Hospital in the Years 1926 to 1930 Inclusive. *J. Urol.*, 1931, xxvi, 67.

Over 50 per cent of the patients whose cases are reviewed by the authors were between sixty and seventy years of age. Twenty per cent were between fifty and sixty, and 56.7 per cent were between sixty and sixty-nine years of age. The authors emphasize that operation should be performed before the obstruction has produced renal and circulatory damage. During the last three years patients have been seeking treatment earlier; 36.6 per cent came with acute obstruction and retention.

A non-protein nitrogen value of 40 mgm. per 100 c.cm. is the highest at which it is safe to perform

prostatectomy. In 1926, 47.8 per cent, and in 1930, 67.5 per cent of the patients came for treatment with a non-protein nitrogen value of 40 mgm. or less. The excretion of phenolsulphonphthalein in two hours should not be less than 40 per cent and the non-protein nitrogen less than 40 mgm.

Over 50 per cent of the patients whose cases are reviewed had catheter drainage for from seven to fourteen days before operation. Of these, 24.3 per cent had a cystotomy before prostatectomy. It is unwise to do a 1-stage prostatectomy before a week of catheter drainage. The second stage of the 2-stage operation should not be performed before from ten to eighteen days of drainage.

Prostatic obstruction is a cause of hypertension. Digitalization will sometimes carry a borderline case through. In the determination of operability the cardiac specialist should be consulted. The non-protein nitrogen is more important than the excretion of phenolsulphonphthalein. The general condition must also be considered.

The authors use almost exclusively local anaesthesia for cystotomies and spinal anaesthesia for prostatectomies. However, nitrous oxide and oxygen with a small amount of ether is a good anaesthetic for all good risks. In the preparation of the skin an ether scrub is followed by the application of Scott's solution.

The types of operation are the 1-stage suprapubic prostatectomy which is suitable for good risks, the 2-stage suprapubic operation for poor risks, and the perineal operation.

All removed prostates should be examined pathologically. Often an adenocarcinoma is found in a prostate which grossly appeared benign.

In the cases reviewed the length of time the patient remained in the hospital after the operation averaged five weeks, but ranged from two weeks to five months. The patients subjected to the perineal operation were out of the hospital soonest, but did not obtain as good functional results. In four years the mortality has dropped from 18.8 to 5.8 per cent.

BENJAMIN F. ROLLER, M.D.

Torek, F.: Orchiopexy for Undescended Testicle.

Ann. Surg., 1937, xciv, 97.

Torek describes an operation for undescended testicle which he has used with success since 1906.

The testicle is exposed through the usual incision and the vas and spermatic vessels are freed of connective tissue as high up as necessary to allow the testicle to be brought well down without traction. Then, a new pathway and scrotal sac are fashioned with the fingers and the testicle is brought down through this pathway, out through an incision in the scrotum and through a corresponding incision in the thigh, and fastened to the fascia lata. The skin edges of the scrotal wound and of the thigh wound are then approximated. The testicle is left in this position for from four to six months and at the end of that time is released. In cases of bilateral non-descent, the other testicle is operated upon at the time the first testicle is released from the thigh.

ANDREW McNALLY, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Närvi, E. J.: Bone Diseases Caused by Overloading (Durch Ueberlastung hervorgerufene Knochenkrankungen). *Acta. chirurg. Scand.*, 1931, lxxviii, 211.

The author reports his observations regarding March fracture or so-called Deutschlaender's disease of the metatarsal bones and a similar disease of the tibia which was first described by Ollonquist. He attempts to explain the pathogenesis of these conditions with the aid of roentgenograms. He believes that overloading causes stasis and thrombosis in the soft parts surrounding the bone and thereby interferes with the nutrition of the periosteum. The consequent swelling can always be observed clinically as a painful mass on the dorsum of the foot and on the tibia. During the progress of the condition bone resorption results from the inadequate nutrition. This is manifested in the roentgenogram by one or several fissures. In the thin metatarsal bones a broken line can be seen running through the bone. The tibia first shows fissures penetrating deeply into the bone and an opacity of the bone structure; later, a callus formation and an induration of the bone appear.

Baer, W. S.: The Treatment of Chronic Osteomyelitis with the Maggot (Larva of the Blow Fly). *J. Bone & Joint Surg.*, 1931, xiii, 438.

After observing, during the war, that infected wounds accidentally contaminated with maggots on the battle fields became clean and healed quickly, the author determined to try the insertion of maggots into chronic osteomyelitis sinuses. Preliminary trials were encouraging, but the occurrence of a few secondary infections due to tetanus and gas bacilli showed that it is necessary to employ sterile maggots. By considerable experimentation a process has been evolved by which the larvæ can be raised under aseptic conditions from the blow fly, the eggs being sterilized in a solution containing 25 per cent alcohol, 0.5 per cent hydrochloric acid, and a 1:2,000 solution of bichloride of mercury. This method is described in detail. Before being used, the larvæ are cultured for both aerobic and anaerobic bacteria. They may be kept for a few days by placing them in bottles with food in an ice box at a temperature of 40 degrees F.

The wound to be treated is prepared by washing it with sterile water. No iodine or other antiseptic is used. After the soft tissues have been widely opened and the dead bone has been cleaned out, the wound is packed with gauze for from twenty-four to forty-eight hours to stop the hæmorrhage. The skin around the edge is then covered with adhesive

and the wound filled with maggots. The maggots are held in by a wire cage shaped around the wound and bound on by adhesive tape. Sunlight or artificial light is applied to drive the maggots into the deep parts of the wound. A new supply is introduced every five days. In the cases of children, the wound is usually healed in six or seven weeks. In the cases of adults, healing takes longer. Very soon the reaction of the wound becomes alkaline and the odor ceases. The larvæ act as scavengers, destroying dead tissues. They seem even to loosen sequestra. Bacteria rapidly disappear, probably because of the change in the chemical reaction of the wound.

The author reviews eighty-nine cases of chronic osteomyelitis treated with maggots. Most of the patients were children, but some were adults with lesions of long duration. Healing occurred in forty-eight of the cases. The time required varied from five weeks to about a year, but as a rule was about four months. The maggots were introduced from two to thirty-eight times, but the average number of times was ten.

In acute osteomyelitis the introduction of the maggots is started four or five days after the initial drainage.

The treatment has been tried also in tuberculosis of bone, but the length of time it has been employed in this condition is still too short to permit definite conclusions as to the results.

WILLIAM ARTHUR CLARK, M.D.

Kulowski, J.: The Orr Treatment of Osteomyelitis and Allied Suppurative Processes. A Statistical Analysis and Discussion of 155 Cases. *J. Bone & Joint Surg.*, 1931, xiii, 538.

The author reviews a series of 130 cases of osteomyelitis, 16 cases of suppurative arthritis, and 9 cases of extensive soft tissue suppuration which were treated by the Orr method.

He states that to obtain the best end-results by this procedure it is necessary to make a fairly large incision and separate the tissues only far enough to afford access to the diseased area. A generous incision will allow healing to proceed from the bottom of the wound and prevent premature closing of the soft parts. The resultant scars will not necessarily interfere with function later. If old sinuses and scarred areas are present they should be excised in order to establish a subsequent healthy basis for the growth of granulations. Abundant granulation is assured also by approaching the diseased area through a thick layer of soft tissue. Drainage will be facilitated by placing incisions in the dependent parts in order to employ the aid of gravity.

Saucerization should be done if it is necessary for good drainage, and all diseased necrotic bone

removed. Orr states that saucerization is not essential as long as a sufficient bony opening is made. If curetting is done, it should be performed gently so as not to damage healing tissues.

The cavity should be dried thoroughly, with the use of iodine and alcohol. Dryness of the cavity is most important. Stagnant blood furnishes a perfect culture medium for bacteria.

The wound should be packed wide open, but not tightly, with vaseline gauze. Too much pressure will retard growth. The pack does not cause retention of pus; it acts merely as a buffer. Drainage is usually profuse. As a rule, marked maceration may be prevented by the application of extra vaseline strips along the edge of the wound.

After the treatment the limb should be placed in the neutral position for absolute physiological rest and immobilized in a plaster cast. The joints above and below the lesion should be fixed. Immobilization and rest must not cease with the healing of the wound; they should be continued persistently until functional stimulus has produced the proper structural reaction in the bone. Braces should be worn for from six months to a year after the wound has healed. The primary cast may remain undisturbed for from one to two months. The only indications for postoperative inspection of the wound are pain and fever. No antiseptics should be used after the operation. As a rule the vaseline pack will gradually become extruded. Small sequestra will be extruded during the course of healing.

The possibility of ankylosis need not cause much concern. Casts may produce temporary stiffness, but if the joint has not been involved, motion is usually recovered.

In conclusion the advantages of the Orr method are summarized as follows:

1. It is based on the principles of adequate drainage and immobilization.
2. It is a painless, economical, universal method which is applicable to any stage of osteomyelitis.
3. It greatly decreases the period of hospitalization.
4. It simplifies the transportation of the patient.
5. It prevents sequestration.
6. It improves the general condition.
7. It gives a good functional end-result.
8. It often prevents loss of the limb by amputation.
9. Its mortality is insignificant.
10. It is the only treatment that satisfies all the tenets of orthopedic surgery.
11. It is a procedure suitable for the average orthopedic surgeon.
12. It shortens the postoperative course of a condition which, previous to its introduction, was often intractable.

H. EASLE CONWELL, M.D.

Geschickter, C. F.: Fibrocartilaginous Tumors of Bone. *Arch. Surg.*, 1937, xlii, 215.

There seems to be an analogy between different forms of neoplasms and different stages in embryonic

and phylogenic development of tissues. The most malignant bone tumors have a histological resemblance to the most primitive tissue such as the notochord, while benign bone tumors are composed mostly of the tissues which constitute the final stage in bone development, that is, cortical and spongy bone.

The chondromyxosarcoma contain very primitive tissue and are very malignant. The chondromata represent an intermediate stage of tissue and may or may not be malignant. The osteochondromata resemble the final stage of bony tissue and are benign.

Almost all of the osteochondromata occur in the second decade of life. Those appearing at this age are either congenital or traumatic, whereas those occurring later in life are more often infectious. Osteochondromata occur most frequently at both ends of the femur and at the upper end of the tibia and the humerus. In a series of 250 cases there were twice as many males as females. The average duration of the symptoms was slightly over five years. This length of time indicates a benign growth, but there are instances of sudden exacerbation resulting in malignancy. If the growth causes pressure, edema may appear. The lesion is nearly always single, but in rare hereditary forms it may be multiple. Local examination reveals a hard swelling firmly fixed to the bone without attachment to the overlying soft tissues. If there is any soft swelling it is usually due to fluid in a bursal sac. The roentgenogram may show a pedicle or a broad base of normal looking bone which merges imperceptibly with the cortex. There is always a cartilage cap, which is either very small or large and irregular like a cauliflower. If this cartilage part appears ill defined and presents areas which seem to be absorbing and encroaching on the base of the tumor, malignancy should be suspected.

Gross specimens show a smooth shiny covering consisting of a thin fibrous envelope and a layer of cartilage about 1 cm. thick. Under this capsule the main bulk of the tumor is composed of cancellous bone intermixed with cartilage. Tendon ends are often blended imperceptibly with the thin fibrous layer which covers the tumor. This suggests that the entire tumor growth may be an exaggeration of the tubercle to which the tendon is normally attached. Sometimes, however, the structure may be analogous to that of a joint, showing spongy bone, a cartilage layer, a synovial membrane, a bursal sac, and fluid, all of which suggest a supernumerary articulation. The microscopic picture is that of quiescent tissue. There are occasional isolated zones of active proliferation. The cartilage is hyaline, and the thin connective tissue film is hyalinized. The bone is cancellous and contains a considerable amount of fatty bone marrow.

These osteochondromata must be related histogenetically to the extraskeletal blastema of the embryo as tissue transitions typical of osteochondroma appear in normal tendons near their insertions and

in normal joint capsules at their reflection from the joint, and it is from the blastema that joints and tendons are developed. Tendons insert into the bone directly and not into cartilage. The bone sends tissue up to meet the tendon, forming a rough tubercle, and the periosteum extends over this tubercle, blending with the tendon sheath. If the periosteum fails to blend with the tendon sheath the proliferative tissue of the tendon near its insertion will not be properly limited and a tumor may result. In exostoses of inflammatory origin the growth is due, not to deficiency of the periosteal covering, but to overstimulation of the cartilaginous centers in the tendon near its insertion or in the joint capsule near the margin of the joints. These spurs are not distinguishable microscopically from neoplasms of the osteochondroma group.

Multiple exostosis or deforming chondrodysplasia is usually hereditary and accompanied by curving, shortening, and other irregularities of the bones. It is thought to be due to deficiencies in the periosteum where the perichondrium persists and functions. Its usual sites are the shafts of the long bones and its result is usually a pronounced diminution in the patient's height. One of the more common deformities is shortening of the ulna and the fibula in relation to the radius and the tibia. Histologically, the growths are similar to single exostoses.

Chondromata and chondromyxomata are benign tumors occurring between the twentieth and thirtieth years of age. Their typical sites are the small bones of the hands and feet, the ribs, and the spine. They are very rarely multiple. The roentgenogram shows large rarefied areas in the shafts of the bones with expansion and thinning of the cortex. Gross specimens have the appearance of a lobulated gelatinous growth, the many small pockets containing cartilage of a rubbery consistency or, when the specimens are large, a syrupy fluid. Microscopically, the cartilage is practically of the normal hyalin form with cells in pairs or tetrads. In the capsule, especially in the smaller chondromata, cartilage of the fetal type may be found.

Histogenetic studies suggest that these growths represent supernumerary joint cartilages. They occur most frequently in places where the embryonic precartilaginous tissue has been abundant and there are many joints, such as the fingers and toes. Aberrant persistent strands of the precartilaginous tissue later give rise to cartilage islands.

If these chondromata become painful or so large as to cause symptoms they should be surgically removed. Recurrence may result from accidental transplantation of some of the tissue. About 25 per cent of these chondromata developing in large bones recur. Those of large size in the region of the spine or sternum or in the long bones are potentially malignant. Their extirpation should therefore be followed by radium therapy.

Although in many cases of primary chondromyxosarcoma it is impossible to predict whether the outcome will be malignant or benign, there is 1 form

which shows a true sarcomatous nature from the beginning. The latter arises periosteally and at first does not involve the cortex or medulla. There is an abundant hyalin matrix with myxomatous tissue, fetal cartilage and fringes of osseous tissue which is highly proliferative. This tumor occurs most frequently near the knee and in the pelvic and shoulder girdles. Its course is acute and rapid. The pain becomes more and more severe, and after five or six months cannot be relieved. The structure of the neoplasm is so translucent to the roentgen rays that the faint shadow in the film may be overlooked or may be mistaken for that of myositis ossificans. Autopsy or biopsy in advanced cases shows that the sarcoma finally breaks through the cortex and invades the marrow cavity. A striking characteristic is the tendency toward metastasis into veins. Microscopically, the tissue shows all of the embryological stages of bone formation, but adult bone formation is not prominent. The presence of myxoma and fetal cartilage, malignant nuclei of cartilage cells, and round cells midway between fetal cartilage and chondroblasts is helpful in identification. Five-year cure is rare. It occurred in only 5 per cent of 73 cases studied. Radical resection or amputation must be followed by the use of a radium pack.

Secondary chondrosarcoma which arise from benign exostoses usually appear in persons over thirty years of age. Although they are considered primarily benign, they often result in death from metastases or repeated recurrence. Their most frequent sites are the upper end of the humerus, the ribs, and the calcanei. As a rule there is a history of an innocent lump persisting for many years after an injury and then rather suddenly becoming enlarged and painful. The roentgenogram shows a dense bony center attached to the cortex and surrounded by a fuzzy shadow of lesser density. In advanced cases, isolated bone flakes are seen and the growth is destroying the cortex and invading the medulla. Microscopically, the tissue resembles that of the primary chondrosarcoma, but shows a much smaller amount of myxomatous material. Of 50 patients treated for secondary chondrosarcoma, only 12 (24 per cent) were living at the end of five years. Radium is very effective in this form of sarcoma and should be used after excision and cauterization.

WILLIAM ARTHUR CLARK, M.D.

Benedict, E. B.: *Carcinoma in Osteomyelitis*. *Surg., Gynec. & Obst.*, 1931, liii, 1.

The author reviews the literature of malignancy developing in osteomyelitis, beginning with Marjolin's first description in 1828. He then reports 12 cases which were found in 2,400 cases of osteomyelitis treated at the Massachusetts General Hospital. In all of these 12 cases the femur, tibia, or foot was involved and in almost all of them the osteomyelitis had been present for at least thirty years. The malignancy always develops from the epithelium lining the sinus. In most cases the growth is visible, but in a few the malignancy

spreads into the cavity of the bone and is found only on exploration. A roentgenogram is not diagnostic as the carcinoma is frequently hidden by the bone destruction.

The carcinoma associated with osteomyelitis has a low grade of malignancy and in all cases thus far reported has been cured by amputation. In two cases in which the roentgenogram showed very little bone destruction and the carcinoma seemed to involve only the wall of the cavity, a thorough curettage was sufficient.

MAURICE L. DALE, M.D.

Vallebona, U.: A Contribution on Dyschondroplasia (Contributo allo studio della discondroplasia). *Chir. d. organi di movimento*, 1931, xvi, 111.

Dyschondroplasia was described by Ollier in 1899 as a unilateral affection. Vallebona, in reporting two cases of his own, demonstrates that it is sometimes bilateral. The condition is a bony exostosis due to the implantation and proliferation of cartilage.

The author's first case was that of a boy sixteen years old who presented an osseous mass in the right side of the chest just below the nipple, the lateral upper third of the left humerus, the left elbow joint, the lower third of the left ulna, both knees, and both ankles. The left ulna was appreciably shortened, and the left wrist presented a typical Madelung deformity.

The second case was that of a man thirty-one years of age who had a marked enlargement of both knees and ankles. In the region of the knee joint the mass was confined to the lower third of the femur and the upper third of the tibia. The medial crests of both tibiae were irregular, especially in their lower thirds.

In both cases the masses were hard, fixed, and somewhat irregular. The involved extremities appeared rather bulbous. Deep palpation failed to reveal tenderness or pain.

Roentgenological examination in dyschondroplasia reveals bony changes in the region of the metaphyses characterized by an increase in the size of the bone and a decrease in its density. The metaplasia originates from the articulating cartilages and extends more or less toward the diaphysis. The cartilaginous proliferation may invade the medulla or the cortex, and finally emerges subperiosteally as a bony exostosis.

By some, the condition has been attributed to the faulty production of cartilage, and by others to the absence or deficiency of bony deposits. According to a third theory, the condition is the result of the return of the bone to its original cartilaginous connective tissue state. Virchow ascribed it to hyperplasia of previously dormant cartilaginous rests. According to Speiser, it is the result of hyperactivity of the deeper portion of the periosteum. More recently, it has been attributed to an abnormal development and ossification.

Dyschondroplasia differs from multiple enchondromata in its anatomical distribution. While it

may involve any bone, it occurs most commonly in the long bones. Enchondromata are found most frequently in the metacarpals and phalanges of the hands and less frequently in the metatarsals and phalanges of the feet. In the roentgenogram, multiple enchondromata appear oval and more transparent than the bones in which they develop.

The author is of the opinion that Madelung's deformity is morphologically analogous to dyschondroplasia and that Koehler's disease, Perthes' disease, Osgood-Schlatter disease, and Kienboch's disease of the semilunar bone resemble it pathologically-anatomically.

S. L. GOVERNALE, M.D.

Leriche, R., and Jung, A.: The Present Status of the Problem of Ankylosing Polyarthritits and Its Treatment by Parathyroid Operations (Position actuelle du problème de la polyarthrite ankylosante et de son traitement par les opérations parathyroïdiennes). *Lyon chir.*, 1931, xxviii, 408.

In 1926, Oppel demonstrated that a large number of patients with ankylosing polyarthritits had hypercalcemia. He attributed the hypercalcemia to malfunction of the parathyroids and suggested as treatment unilateral parathyroidectomy. In fifty-five cases in which a unilateral parathyroidectomy was performed at his clinic the immediate results were very good and the end-results were favorable.

Ankylosing polyarthritits frequently occurs in young persons. It is associated with pain and in a few months results in a state of invalidism. It is resistant to ordinary medication and runs a progressive course.

In their observations on twenty cases, the authors found that the condition has a uniform pathological anatomy, whatever its cause. They state that in cases in which it is accompanied by hypercalcemia, parathyroidectomy has a definitely beneficial effect and should be performed as soon as the presence of the hypercalcemia is established. In traumatic and infectious arthritis the blood calcium is normal and constant. The skeleton acts as a storehouse of calcium and aids the organism in maintaining the blood calcium at a constant level. Hyperthermic processes near the bones are accompanied by merely local changes which do not affect the blood calcium. In parathyroid disease there is a process of local or general decalcification which is associated with hypercalcemia. Persistent hypercalcemia does not occur without parathyroid action. In the differentiation of the type of arthritis the site of polyarthritits is of no aid.

The authors discuss three types of polyarthritits with hyperparathyroidism: (1) rhizomelic spondylosis with kyphosis (Bechterew), (2) rhizomelic spondylosis in the erect attitude (Struempell-Marie), and (3) peripheral polyarthritits which affects only the fingers, wrists, elbows, toes, and knees. In the diagnosis of these conditions it is necessary to rule out an infectious cause such as sore throat, gonorrhea, tuberculosis, articular rheumatism, and gout, in which conditions the blood calcium is normal.

Polyarthritis with parathyroid disturbance is characterized by an increase in the blood calcium, generalized asthenia, diminished reflexes, and an accelerated pulse rate.

The authors mention also an intermediate type of arthritis associated with a hypocalcemia concerning which little is yet known.

In discussing the technique of parathyroidectomy, the authors comment on the difficulty of identifying the parathyroid glands. In the three cases of polyarthritis in which they operated upon the parathyroids they excised one of the two inferior glands. While the clinical results were good, they recommended ligation and severance of the inferior thyroid artery as the surest method of diminishing parathyroid function. In all of the three cases mentioned improvement was noted within a few hours after the operation and the blood calcium was restored to normal. One of the patients had a recurrence six weeks after the operation, but the two others were still well at the time this report was made four months later. JACOB E. KLEIN, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Robertson Lavalley, C.: My First 100 Cases of Pott's Disease. Statistics of the Robertson Lavalley Method in Pott's Disease (Mis primeros 100 casos de mal de Pott. Estadística del procedimiento Robertson Lavalley en mal de Pott). *Semana méd.*, 1931, xxxviii, 1743.

The author has found that his method of inserting autogenous grafts into the hyperæmic tuberculous zone in bone and joint tuberculosis has a specific humoral action which leads to elimination and cicatrization of the tuberculous process. The fibrous transformation of the tuberculous lesions brings about a fibrous osteitis. In cases in which death has occurred later from pulmonary tuberculosis autopsy has disclosed no encapsulated caseous foci such as are seen after cure by rest and heliotherapy. After the operation, treatment must be given to prevent fibrous retraction. In order to bring about the humoral reaction it is necessary to perforate the hyperæmic tuberculous zones. If these zones are not perforated, the procedure is not a true Robertson Lavalley operation. In order to be sure that they have been perforated, anteroposterior and lateral roentgenograms should be made before and after the operation.

The application of these principles in the treatment of tuberculosis of the spine has given surprising results. Of the author's first series of 100 cases, a cure resulted in 76 and improvement in 7. In 3 cases re-operation was necessary. Eight patients were not cured and 6 died within a month after the operation. The incidence of poor results was highest in patients under six years of age because in young children the vertebræ are small and the fibrous and cartilaginous part is relatively large so that it is difficult to reach the hyperæmic zone with the graft. As experience

with the operation has increased the results in the young have been improved.

AUDREY GOSS MORGAN, M.D.

Miltner, L. J.: Stabilization of the Foot. A Study of Late Results. *J. Bone & Joint Surg.*, 1931, xiii, 502.

The author reviews the results of operations performed in Steindler's clinic prior to 1928.

Of the 128 patients subjected to astraglectomy, 122 were available for study of the late results. In 112 cases the operation was done on account of infantile paralysis. In this group, function was good in 101, fair in 6, and poor in 5. Form was good in 98, fair in 7, and poor in 7. Of the 10 cases in which the operation was done for a condition other than paralysis, function was good in 6 and fair in 3, and form was good in all but 1. In 28 cases, pain occurred when the patient was again on his feet; in 23 it was mild and in 5 it was severe. Its cause was an operative error in alignment, loose bone fragments, arthritis, or recurrence of the deformity. Most of the patients with recurrence of the deformity were under fifteen years of age. The recurrence seemed to be due to secondary growth changes.

Of 185 patients subjected to tarsal arthrodesis, 143 were available for study of the end-results. About 85 per cent of the operations were done by the method of Hoke which was modified to suit the requirements of the individual case. Other methods used were the subastragaloid arthrodesis of Davis, the triple arthrodesis of Ryerson, the arthrodesis of Dunn, and the osteoplastic operations of Jones. The time that had elapsed since the operation ranged from one year to ten years and averaged three years. In 95 per cent of the cases excellent results were obtained. Only 6 patients complained of persistent pain. In 2 cases the pain was due to infectious arthritis. Sixteen of the 116 paralytic patients showed recurrent deformity. Most of the latter were under twelve years of age. The cause of the recurrence was incomplete fusion due to operative error. Nine of 17 spastic patients had a recurrence of the deformity after several years even though fusion was complete. This might have been due to a combination of growth and uncontrollable muscle imbalance.

Twenty-five patients subjected to tendon transplantation were studied. The majority of the transplantations were done in connection with bone operations. The results were considered good in 17 cases, fair in 5, and poor in 3. The factors most important for good results seemed to be physical therapy for muscle re-education of the transplanted tendon, secure fixation with proper tension, and the prevention of adhesions.

Panastragaloid arthrodesis was done in 87 cases. Of the 74 patients who were traced, 67 had a good result and 7 a fair result as regards both function and form. Ten of the paralytic patients complained of mild intermittent pain. In some instances the pain was relieved by shoe changes.

In general, the stabilizing operations proved satisfactory in 85 per cent of the cases. The author emphasizes that no one operation can be employed for all cases.

WILLIAM ARTHUR CLARK, M.D.

FRACTURES AND DISLOCATIONS

Juvara: Osteosynthesis by the External Fixation Method—Fixator and Ligator (Contribution à l'osteosynthèse par la méthode de la fixation externe—fixateur et ligateur). *Bull. et mém. Soc. nat. de chir.*, 1931, lviii, 1098.

For osteosynthesis by external fixation the author uses an apparatus consisting essentially of an external rod with two attached rod or peg-like devices which reach through the external incision and intervening tissues to grip the fractured bone. The mechanism called the "fixator" consists of a short hollow metallic tube with a toothed extremity to grip the bony surface superficially. Through the lumen of the fixator are passed drilling and reaming instruments to make a cavity into which is inserted a screw peg to grip and hold the bony fragment to the apparatus. The device called the "ligator" differs essentially from the fixator only in the fact that, in place of the screw peg, a heavy ligature is passed through the hollow tube and fixed firmly. In oblique fractures in which the line of fracture is sufficiently long, a fixator is usually attached to each fragment and the ligator is applied directly over the oblique line of fracture. In the more transverse forms of fracture two fixators are attached to each fragment. The advantage of this apparatus over others is the rapidity and ease of its application.

The author reports sixteen cases, including fractures of the thigh, leg, and arm, in which the apparatus described was employed.

JOHN W. BRENNAN, M.D.

Aquilué, A.: The Treatment of Displaced Fractures of the Clavicle by the Application of a Crossed Posterior Thoracic Plaster Bandage and Abduction of the Arm (El tratamiento de las fracturas de la clavícula con desplazamiento por el vendaje enyesado cruzado posterior torácico con abducción del brazo). *Rev. de cirug. de Barcelona*, 1931, 1, 223.

The bandage described and its mode of application are shown in illustrations. The article includes also roentgenograms of patients treated by the method. When the bandage is properly applied after reduction of the fracture it retains the fragments in place long enough for consolidation to occur and results in anatomical restitution with little or no deformity. Because of the abduction of the arm and the fact that the arm is only partially immobilized, motion of the scapulohumeral joint being possible, muscle atrophy, rigidity, and scapulohumeral periarthritis are prevented and there is complete restoration of function as soon as the bandage is removed or after a few days of mobilization. Even in cases in which reduction is not obtained, the bandage cor-

rects the displacement and the fracture heals with minimal shortening and deformity and without rigidity or scapulohumeral periarthritis. The bandage is of particular value for ambulatory treatment.

AUDREY GOSS MORGAN, M.D.

Henry, M. O.: Proximal Osteosynthesis in Intracapsular Fracture of the Hip. An Experimental Study. *J. Bone & Joint Surg.*, 1931, xiii, 539.

The author reports fifteen proximal osteosyntheses for intracapsular fracture of the hip which were done on dogs. The animals used were not young. While their exact ages were unknown, their epiphyseal lines were not discernible on roentgen-ray examination. The introduction of a nail or screw from the proximal side by the Hey-Groves method necessitates severing the ligamentum teres in order to dislocate the proximal fragment for pegging. Since the ligamentum teres is the only soft part attachment for a blood supply to the head of the femur, this procedure enabled Henry to make a study of the fate of the head divested of all soft part attachments.

As no co-operation on the part of the subject could be expected in experiments on animals, a strong material was required for internal fixation. For this purpose the author devised rustless steel screws made from heavy Boehler nails. The screws were machined with coarse, double-pitched threads and tapered slightly at each end to a head with a slot. They were then highly polished to increase the inherent property of the steel to be inert in bone. A double-headed screw of this type was introduced proximally through a drill hole the size of its core which was made in the head and neck of the femur and was removed later from the trochanteric side.

In the dog, as in man, the spongiosa is densest toward the proximal side of the femoral head. Along the axis of the neck it becomes less dense and no compact bone is encountered until the trochanter or cortex of the shaft is reached. A suitable device for internal fixation must therefore be long enough to bite well into the denser spongiosa of the proximal side of the head and simultaneously grasp the cortex of the shaft or trochanter.

The article is summarized as follows:

1. Hey-Groves' method of proximal osteosynthesis was used in fifteen experiments on dogs. Round nails were found to be inadequate for fixation of the fragments of intracapsular osteotomy of the neck of the femur without external fixation.
2. Satisfactory contact and adequate fixation of the fragments of intracapsular osteotomy of the neck of the femur in dogs was obtained by a rustless steel screw of a special pattern which was practically inert in bone.
3. Early functional stimulation of the circulation is of prime importance in the healing process of intracapsular fracture of the hip.
4. Early, continuous, and accurate contact, with absolute fixation of the fracture surfaces is of para-

mount importance in the healing of fractures in the presence of synovial fluid.

5. In intracapsular osteotomy of the neck of the femur of the dog, the capital fragment, devoid of all soft parts, readily unites under the physiological conditions essential to the healing process in bone.

H. EARLE CONWELL, M.D.

Caralps, J. L.: The Posterior Marginal Fragment in Fractures of the Ankle (El fragmento marginal posterior en las fracturas de la garganta del pie). *Rev. de cirug. de Barcelona*, 1931, 1, 256.

Fracture of the posterior margin of the tibia was observed before the introduction of the roentgen ray, the first case having been described by Earle in 1829. The author reports twenty-five cases, supplementing the histories with roentgenograms and sketches of the operative procedures used.

Most posterior marginal fractures are seen in Dupuytren's fracture. The fracture may result from the impact of the astragalus on the posterior border of the tibia or avulsion by the posterior peroneal ligament. The fragment varies in size from a small bit of the cortex to the greater part of the lower articular surface of the tibia. In a profile roentgenogram the latter appears as a triangle with its base downward. In marginal fractures associated with

other malleolar fractures there is marked subluxation outward and backward.

In simple fractures, good reduction can almost always be obtained by the external manipulations ordinarily used for the reduction of fracture of the ankle. In fresh compound fractures in which the marginal fragment occurs in a Dupuytren fracture or a malleolar fracture from adduction, good functional results can be obtained by fixing the internal malleolus or both malleoli. Direct operation on the posterior marginal fragment should be done only exceptionally as it is difficult.

An isolated posterior marginal fragment is produced by force acting vertically from below upward with the foot in plantar extension and without internal or external deviation. As a rule the traumatism is not very intense. There is retromalleolar ecchymosis with equinus of the foot from contraction of the posterior muscles and pain on pressure at the posterior border of the tibia. Sometimes the lesion is mistaken for a simple sprain because the local edema and equinus do not develop until late and the pain and functional weakness are not severe. In many cases the diagnosis required roentgen examination. The treatment indicated is immobilization for fifteen days followed by massage. The prognosis is good.

AUDREY GOSS MORGAN, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Patey, D. H.: *The Injection Treatment of Varicose Veins and Its Bearing on the Problems of Thrombosis.* *Lancet*, 1931, ccxii, 284.

The author reports an experimental study of thrombosis of varicose veins by the injection method. He discusses the pathological changes resulting from the injections, the relation between thrombosis produced by injections and thrombosis occurring spontaneously, and the possible complications of the injection treatment of varicose veins.

In the experiments reported, various solutions were injected into the marginal ear veins of rabbits and specimens were removed for microscopic study after fifteen minutes and half an hour, then at hourly intervals up to twelve hours, and finally at the end of twenty-four hours. The solutions used included a 30 per cent solution of sodium salicylate, a 5 per cent solution of sodium morrhuate, a solution containing 13 per cent quinine and $6\frac{1}{2}$ per cent urethane, and a 60 per cent solution of glucose. The first three solutions produced thrombosis showing the following stages: (1) intravascular coagulation, (2) destructive changes in the vein wall, and (3) acute inflammatory changes in the surrounding tissues. Intravascular clotting therefore occurs when the vein wall is little altered and before the histological signs of acute inflammation have developed. The glucose solution failed to produce thrombosis.

The means by which the solutions produce intravascular coagulation were also studied. If the trauma produced by the needle is excluded, there remain only four possible explanations of the thrombotic action of the solutions: (1) a direct coagulating action on the blood, (2) the inflammatory reaction set up, (3) a physical action on the vein wall, and (4) a chemical action on the vein wall. The author attributes the thrombosis to a chemical action of the solution on the wall of the vein.

In discussing the relation of spontaneous thrombosis and thrombosis produced by injection, Patey compares the stages of artificially produced thrombosis with the pathological processes of thrombophlebitis, pulmonary embolism, and localized thrombosis of the femoral vein.

The possible complications of the injection treatment include: (1) pulmonary embolism, (2) general symptoms, (3) failure of the vein to respond to the injections, and (4) injection ulcers. Because of the stagnant condition in varicose veins and the inflammatory reaction set up in and around the vein wall which favors early adhesions and organization of the thrombus, pulmonary embolism is extremely

rare. In man, general symptoms are also very rare because the margin between the therapeutic and toxic dose of the solution is wide. In the rabbit, an excessive amount of sodium salicylate produces diffuse hæmorrhage and œdema of the lungs, and an excessive dose of sodium morrhuate, which is a powerful hæmolytic agent, results in the appearance of hæmolyzed blood in the urine or causes sudden death by blocking the capillaries of the lungs with hæmolytic debris and leucocytes. Quinine and urethane kill rabbits presumably by their action on the heart or the central nervous system. Failure of the vein to respond to injection treatment may be due to thickening of the vein, the inner coat of which is composed of a thick mass of cellular tissue. Injection ulcers are usually an indication that the solution has leaked out into the tissues around the vein. Occasionally they result from sloughing of the vein wall.

C. G. SHEARON, M.D.

BLOOD; TRANSFUSION

Schloessmann: *The Nature and Etiological Treatment of Hæmophilia* (Das Wesen und die ursächliche Behandlung der Bluterkrankheit). *Zentralbl. f. Chir.*, 1931, p. 859.

Hæmophilia depends upon a constitutional disturbance and is a source of danger to life. It is a recessive hereditary trait and related to sex. Only males are affected; females remain apparently normal although they transmit the tendency to the disease (conductors). According to the former empirical law of heredity, the tendency to bleed was considered transmissible only through the woman. Recent investigations show, however, that hæmophilia may be inherited also through the man. The bleeder, through all of his daughters, who are conductors, transmits the tendency to his male and female grandchildren. The view held formerly, that the children of hæmophilic parents may marry without danger because theoretically their offspring will be free from a tendency toward hæmophilia can no longer be maintained. Presumably, hæmophilia in the female represents a condition which is clinically and hæmatologically similar to hæmophilia in the male and, like the latter, is inherited. Up to the present time it has not been possible to prove this supposition in any of the cases described as female hæmophilia. Theoretically, the occurrence of true homozygotic female bleeders cannot be excluded, but, actually, they do not seem to occur because the hæmophilic disease tendency in the homozygotic form causes the death of the affected ovum (Bauer's theory of lethal factors). In addition to definitely inherited hæmophilia, sporadic cases in which the condition developed suddenly

without any hereditary relationships have been known to occur. In the latter, the condition does not differ essentially from the true hæmophilia and must also be due to some constitutional factor. Its origin is explainable only by a suddenly appearing pathological change in the hereditary plasma, a so-called mutation. If this is correct, sporadic hæmophilia may also be transmitted and in this condition we must recognize the source of origin of hereditary hæmophilia.

The constitutional picture of hæmophilia itself represents a syndrome. Of the various phenomena, the least prominent is a definite bodily habitus. Hæmophilia is manifested more in constitutional peculiarities of the total cell function and cell structure than in external phenomena. Among the functional peculiarities the most important is the disturbance in the coagulation of the blood which is the essential characteristic of hæmophilia. The question as to the ultimate cause of the hæmophilic disturbance of blood coagulation is still unanswered. We know only that the hæmophilic defect lies in the mother substance of the thrombin in the blood plasma and the blood cells. Whether the disturbance occurs chiefly in the plasmatic or the cellular preliminary stage is unknown. The disturbance of thrombin formation is dependent, not upon an absolute or relative deficiency of mother substances but upon a marked delay in the delivery of these substances to the circulating blood. Therefore, in the final analysis, the hæmophilic disturbance of coagulation is of a purely functional nature. In normal hæmostasis the powers of the blood itself (thrombosis and coagulation) are supplemented to a marked degree by the behavior of the blood vessels. While the vascular reactions produce the first provisional hæmostasis by blocking and changing the course of the circulation, platelet thrombi and coagulated fibrin produce the secondary permanent closure of the blood vessels. In hæmophilia, the first act of primary obstruction to the circulation by the blood vessels occurs as in normal persons, and as a result hæmostasis almost always occurs after a moderate initial hæmorrhage. It is in the second part of the hæmostatic process that the hæmophilic error becomes manifest. When the initial vascular reactions have passed off and the blood again turns toward the wound, the protective wall of blood-platelet thrombi and fibrin coagulation which in the meantime should have been formed in the wounds of the blood vessel is lacking because of the failure of coagulation to occur. Nothing holds the blood back any longer and the hæmophilic secondary bleeding occurs slowly but uncontrollably. No abnormal condition—neither a disturbance of function (capillary reaction) nor a decrease of firmness of the vascular walls—is demonstrable in hæmophilic blood vessels. This negative finding of tests for abnormal fragility or increased permeability of the walls of the blood vessels is the chief aid in the differentiation of hæmophilia from various other hæmorrhagic diatheses. Peculiar manifestations of

the constitutional nature of hæmophilia are the periodical variations in the tendency to bleed. These persist throughout life. Developing and gradually increasing in the first few years of life, the tendency to bleed reaches its maximum at the time of puberty. After puberty there is a slow decrease in the manifestations of the disease which becomes distinct after the thirtieth year of life and continues with age. Variations in the tendency to bleed may occur also in certain decades of life. Some hæmophiliacs are able to sense distinctly the approach of such periods of more severe attacks of bleeding. The hæmophilic defect may be more marked in one case than in another. Accordingly in different bleeders there often is a very different development not only in the disturbance of coagulation, but also in all of the other clinical symptoms of the disease. There are bleeders who show all of the hæmophilic possibilities of bleeding, and others in whom, for example, articular hæmorrhages or internal hæmorrhages are entirely absent. A review of numerous bleeder sibs showed that the difference in the symptomatic picture is not only characteristic of the individual bleeder, but also has a pronounced familial character. There are bleeder families with many symptoms and some with few symptoms. The familial nature of the disease is also a significant constitutional characteristic of hæmophilia.

The treatment of hæmophilia must be aimed to control the hæmorrhages and influence the general hæmophilic condition. For hæmostasis, the local application of hæmostatics and the use of blood transfusion must be considered. Blood transfusion (from 300 to 800 c.cm.) is still the best remedy for the control of hæmorrhages, but does not exert a permanent effect upon the hæmophilic state. The coagulability of the hæmophilic blood cannot be increased by the injection of any substance into the circulation, and the control of distant hæmorrhages cannot be achieved in this manner. Roentgen irradiation of the spleen has failed. The vitaminous remedy, nateina, introduced from Spain, is a definite advance in the treatment of hæmophilia. By its use the symptoms of the disease are considerably diminished, hæmorrhages are rendered less severe and less frequent, and the hæmophilic articular disease is affected favorably for all time. But there are also failures. The improvement achieved is not a decisive improvement which eliminates the danger of bleeding in surgical interventions. It does not change the predisposition or prevent further transmission of the disease. Its effect lasts only as long as it is being used. A cure of hæmophilia cannot be obtained.

In the discussion of this report, MAGNUS stated that an attempt should be made to discover whether the hæmophilia is a condition of the blood alone or involves both the blood and the blood vessels which, under normal conditions, react together.

HABERLAND discussed the treatment of hæmophilia with blood transfusions. He stated that the results are not uniform. The technique of the transference of the blood is important. The ad-

mixture of sodium chloride does not seem to be of advantage in hæmophilia; therefore Percy's direct method should be considered. Transfusion does not cure, but it decreases the tendency to bleed.

COENEN stated that in one case nateina shortened the coagulation time, but not the bleeding time. Accordingly, the patient had a bleeder's joint during the treatment. In cases of hæmorrhages from any source he recommends the intravenous injection of 5 c.cm. of a 2 per cent solution of Congo red.

SCHLOSSMANN stated that an attempt must be made by all clinical and hæmatological means to differentiate true hæmophilia from related essential thrombopænic purpura. Apparently many cases of purpura are diagnosed as sporadic hæmophilia.

E. HEMPEL (Z).

Emile-Weil, P.: Surgical Operations on Hæmophilias (Les interventions chirurgicales chez les hémophiles). *Presse méd.*, Par., 1931, xxix, 1021.

The author states that hæmophilia is not a disease but a hæmatological and clinical syndrome which is of three types, the familial, the sporadic, and the symptomatic. In the familial type, which is hereditary in males through the female line, there is only a retardation of blood coagulation and the hæmorrhages are provoked. In sporadic hæmophilia there is an associated chronic purpura and hereditary syphilis may sometimes be suspected. Symptomatic hæmophilia, which may be either transitory or permanent, may be caused by diseases of the liver with cirrhosis or chronic jaundice.

Postoperative hæmorrhage in cases of hæmophilia may be prevented by the injection of from 20 to 40 c.cm. of blood serum the day before the day of operation and the transfusion of from 200 to 300 c.cm. of blood one hour before the operation. The operation must be well planned and the hæmostasis extended to even the small veins. If the operation injures the tissues, as in dental surgery, if hæmostasis is impossible, as in rhinological surgery, or if the wound cannot be closed on account of drainage, secondary hæmorrhage will occur although immediate hæmorrhage is prevented.

The child to be operated upon must be docile and must have good veins. The necessity for several transfusions in case of secondary hæmorrhages must be foreseen. The author reports the cases of two patients with hæmophilia who were subjected to dental operations and two who were subjected to tonsillectomy and adenoidectomy. He cites also the cases of two hæmophiliacs with suppurative sinusitis who were given transfusions and underwent operation without immediate or delayed hæmorrhage.

Several hæmophiliacs operated upon by other surgeons were prepared for operation, usually by transfusion, by Emile-Weil. Operations for laryngeal cancer, a nasopharyngeal polyp, and the resection of spurs were done without much loss of blood. In a case of pyloric ulcer operated upon by Gregoire postoperative hæmatemesis was prevented by a transfusion of 300 c.cm. of blood, and hæmorrhages

of the wound on the second day were arrested by a second transfusion. The patient was completely cured for a year. In a case of stones in the common duct and gall bladder, operation was made possible by transfusion. The hæmophilia in this case was found to be of biliary origin and the operation cured the patient of the hæmophilia as well as of gall stones and jaundice. In fifty cases of chronic splenomegaly in which the author prepared the patients for operation by transfusion there was neither immediate postoperative nor subsequent hæmorrhage. The beneficial effect of transfusion was evidenced also in cases of gangrenous appendicitis and phlegmon of the tonsil in hæmophiliacs.

In cases of interstitial or intrascrous hæmorrhage associated with hæmophilia operation should not be attempted. It is contra-indicated also in cases of subcutaneous hæmatoma unless there is danger that the hæmatoma will become infected. When hæmorrhage follows a cutaneous wound, careful hæmostasis and suturing should be done even if the wound is small. Blood serum may be used locally or generally. When it is used locally it must be placed in contact with the bleeding tissues. The insufficient clot should be removed with 1 or 2 liters of physiological salt solution and the serum then applied with a compressive dressing. When it has been impossible to apply a good local dressing the author has used only hæmostatic transfusions.

In one of two cases of hæmatoma of the floor of the mouth the author was able to stop hæmorrhage by an intravenous injection of 20 c.cm. of antidiphtheria serum and in the other by a transfusion of 225 c.cm. of blood. All of the disturbing symptoms ceased quickly without surgical treatment. In three of four cases of retro-orbital hæmatoma the eye was already lost, but in the fourth, in which the condition occurring during an attack of grippe, a transfusion of 225 c.cm. was given on the second day and tarsorrhaphy was done on the fifth day without hæmorrhage.

By continuous serum treatment (the injection of 20 c.cm. of blood serum every month) the development of recurrent or spontaneous hæmarthroses may be prevented. When the joints have become ankylosed by hæmarthrosis, surgical operation is necessary. The limb should be straightened out and put up in plaster for about two months. Transfusion should be done before the operation. Posthæmorrhagic fibrous myositis should also be treated surgically after transfusion.

PACCI.

Placitelli, G.: Our Experience with Blood Transfusion (La nostra esperienza della trasfusione di sangue). *Arch. ital. di chir.*, 1931, xxix, 324.

Placitelli reports his experience in 1,800 blood transfusions which he has done in the last two and a half years on the third surgical division of the City Hospital in Venice for various severe conditions. He prefers the direct method without the use of anticoagulants. He employs a 2-way syringe devised by Jubé. The bloods are matched by a direct and a bio-

logical test. By means of the syringe described, from 75 to 100 c.cm. of blood can be injected per minute. As a rule Placitelli used from 500 to 700 c.cm. of blood in each transfusion. He obtained very satisfactory results in 50 cases of severe postoperative shock, 11 cases of anæmia following hæmorrhage, 100 cases of poor general condition before or after operation, 1 case of pernicious anæmia, 2 cases of hæmophilia, and 1 case of asphyxiation from carbon monoxide. In 8 cases of severe infection his results were not outstanding. EUGENE T. LEDDY, M.D.

Stewart, W., and Harvey, E. E.: Blood Transfusion in Two Cases of Auto-Agglutination. *Lancet*, 1931, ccxxi, 399.

The authors report the occurrence of auto-agglutination in a case of anæmia complicating preg-

nancy and a case of thrombocytopenic purpura (Werlhof's disease). In both cases transfusion was necessary and was done. The transfusion was followed by a period of extreme distress which required morphine and adrenalin for relief. In neither case was there any evidence of intravascular lysis of the red cells. In thrombocytopenic purpura a thrombocyte crisis may be induced by blood transfusion.

Auto-agglutination may be hereditary. It is not a manifestation incident to anæmia, in the case reported it was present after the anæmia had disappeared.

Persons with blood belonging to Group O (Group 4, Moss) are universal donors. Blood matching and blood grouping should be done at body temperature rather than at laboratory temperature.

HOWARD A. MCKNIGHT, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Hindmarsh, J.: Intravenous Drop Infusion (Intravenous Tropheninfusion). *Stensk. Laekartidningen*, 1931, 1, 401.

The author believes that intravenous drop infusion has not found the general recognition it deserves; that it has been pushed into the background to some extent by other modes of intravenous treatment introduced at the same time, especially blood transfusion. He uses a salt solution prepared according to the formula of Thies (NaCl, 0.85 per cent; CaCl, 0.03 per cent; and KCl, 0.03 per cent), or a 5 per cent dextrose solution.

Intravenous drop infusion does not require complicated apparatus and is extremely simple. There is no more convenient or more gentle method of introducing large amounts of fluid. However, the procedure possesses certain elements of danger (thrombosis) and for this reason should be used only when it is strictly indicated. In prognostically borderline cases—when there is danger of death from surgical shock, in peritonitis and ileus, and when life is threatened by hemorrhages—drop infusion can often accomplish more than any other kind of treatment. The addition of ephedrine (100 mgm. per 1 liter administered over a period of four hours) often gives a surprisingly good result.

On account of the importance of intravenous drop infusion in surgical practice, certain disadvantages associated with the procedure may be disregarded. Infection and air embolism are theoretically possible, but can be avoided with certainty by a correct technique. The formation of thrombi has been known, but generally is of only relative importance. The thrombi are very similar to those that occur in the sclerosing treatment of varices and do not appear more frequently than after ordinary intravenous injections, as for example, after the use of neosalvarsan. However, the fatal cases, though rare, demand that strict attention be given to the indications. High blood pressure requires special caution, and a tendency toward pulmonary complications and recent recovery from prostatectomy or nephrectomy are always contra-indications.

GERLACH (Z).

Rossi, G.: The Use of Hirudin in Postoperative and Puerperal Phlebitis (La irudinizazione nelle flebiti post operatorie e puerperali). *Polidn.*, Rome, 1931, textviii, sez. prat. 989.

Rossi reports eight cases of postoperative phlebitis, one case of puerperal phlebitis, and two cases of primary phlebitis in which the use of hirudin gave quick and excellent results. Hirudin is obtained

by macerating the heads of leeches and extracting them in water. The solution is a very strong anti-coagulant.

The use of leeches in phlebitis was first suggested by Termier, who, at the French Surgical Congress in 1922, reported nineteen cases in which this treatment was employed successfully.

The procedure consists in the application of three or four leeches to the region involved at the first sign of trouble. If necessary, the application is repeated after two or three days. Rarely more than four applications are needed. This treatment is followed by arrest and regression of the oedema, a rapid decrease of the pain and cutaneous tenderness, and a rapid fall of the temperature. It has been found of no value in quiescent phlegmasia, severe infections, cases of secondary hemorrhage after delivery, or cases in which the provocation of a hemophilic state must be avoided.

EUGENE T. LEDDY, M.D.

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Figli, F. A., and Cutts, R. E.: Actinomycosis in Childhood. *Am. J. Dis. Child.*, 1931, xlii, 279.

In the human being, actinomycosis is primarily a disease of early adult life. The rarity of the condition in children is evidenced by the fact that many textbooks on pediatrics do not mention it and those that do mention it describe it only briefly. In most of the reported cases of the infection in children the disease was well advanced when it was recognized, and with few exceptions it progressed to a fatal termination.

In this article the authors report 14 cases of actinomycosis affecting children between two and fifteen years of age who constituted approximately 3 per cent of 450 patients with actinomycosis examined at the Mayo Clinic. Nine of the children were boys. The cervicofacial area was involved in 10 cases (71 per cent) and the abdomen in 4 cases. In 2 of the latter the infection was first evident in the lumbar region.

An outstanding point of difference in the histories of children and adults was the absence of previous trauma in the latter. Some of the children had repeated attacks of sore throat before the onset. Several had carious teeth and diseased tonsils which may have been etiologic factors.

The usual sequence in the cervicofacial lesions was the development of a definitely circumscribed, indurated, tender swelling, usually in the cheek, parotid, or submaxillary region, accompanied or followed first by dull aching or acute pain and later by the appearance of redness of the overlying skin

and fluctuation. In all deep infections about the head, trismus or ankylosis of varying degree was an early sign.

In all of the abdominal cases, systemic symptoms were pronounced. In 2 of these cases the condition followed an appendectomy. In the remaining 2 the onset was insidious, with malaise followed by progressive loss of weight and strength, secondary anæmia, and the development of a tender mass in the lumbar region.

Eight of the 10 patients with cervicofacial lesions gave a history of discharging sinuses or had such sinuses at the time of examination. Sinuses were present in all of the abdominal cases.

The duration of symptoms prior to the patient's registration at the Clinic varied from four weeks to thirteen months in the cases of cervicofacial lesions and from eight months to five and a half years in the cases of abdominal lesions.

Actinomycosis must be considered a possibility in cases of tumor, chronic infection, or persistent sinus of indeterminate nature even if the patient is young. In many cases observation over a long period with repeated examination of the discharge from sinuses or freshly opened abscesses will be necessary to demonstrate the actinomycoses.

In the cases reported by the authors the treatment consisted of the internal administration of a saturated solution of potassium iodide, a dosage of 4 or 5 minims 3 times daily being gradually increased 1 drop daily or every second day to the point of tolerance. The youngest patient, a child aged two years, received a maximal dose of 30 drops of the solution 3 times daily. The administration of the drug was continued for two or three months after the disappearance of all symptoms. Radium irradiation with distance and screening was administered over the affected area at intervals of from three to six weeks as long as there was evidence of active infection. In a few instances deep roentgen-ray treatment was given with apparently beneficial results. Continuous hot, moist compresses were applied over the affected area, and free drainage was established as soon as suppuration occurred. At the time of operation the abscess cavity was thoroughly swabbed with tincture of iodine and packed with iodoform gauze. The length of time the patients were under treatment after the diagnosis was established varied from a month to twenty-eight months.

The prognosis of actinomycosis in children, as in adults, varies with the site, extent, and virulence of the infection. When the head and neck are affected the outlook for cure is good unless the infection is unusually virulent and extensive or there is evidence of intracranial or intrathoracic extension at the time treatment is instituted. In abdominal and thoracic cases the prognosis is usually poor. Of the 10 children with infection of the head and neck, 8 are alive and well and have been free from evidence of the disease for periods varying from one year to seven and a half years. One child died from acute anterior poliomyelitis and 1 from pulmonary involvement secondary to extensive deep bilateral cervical actinomycosis. Three of the patients with abdominal actinomycosis are dead. The fourth child with this condition, who was examined at the Clinic more than seven and a half years ago, cannot be traced, but the outlook at that time appeared unfavorable.

ANÆSTHESIA

Wiggin, S. C.: Recent Trends in Anæsthesia. *New England J. Med.*, 1937, cciv, 1283.

Wiggin states that the more important developments in anæsthesia are the use of combinations of gases (nitrous oxide, ethylene, oxygen, and carbon dioxide) with ether; the use of novocain for spinal and regional anæsthesia; and the introduction of new drugs such as the barbiturates, sodium amytal, nembutal, and avertin.

The preliminary preparation of the patient for each type of anæsthesia is described, and the advantages, disadvantages, indications, contra-indications, and administration of each drug used alone or in combination are discussed. The author states that ether is the most toxic of all anæsthetics except chloroform, but still has its indications. The gas-oxygen combination, if well administered, is the best anæsthetic when indicated. Spinal anæsthesia should be used only in selected cases. Sodium amytal and avertin should be employed as preliminary drugs to aid the induction of inhalation anæsthesia. Wiggin believes that avertin is one of the most promising of the newer anæsthetics, but that an ideal anæsthetic has not yet been found. The tendency is toward the use of a more direct method of inducing anæsthesia than the inhalation method.

C. G. SHEARON, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Failla, G., and Henshaw, P. S.: The Relative Biological Effectiveness of X-Rays and Gamma Rays. *Radiology*, 1931, xvii, 1.

It is generally agreed that the effect of ionizing irradiation on a cell depends upon the intensity of the irradiation and the time of the exposure to the irradiation. The authors have attempted to prove by experimental work that the effect depends also upon the quality of the irradiation which reaches the cell.

By a direct method for measuring gamma rays of radium, they have found that the gamma-ray emission of 1 gm. of radium is 36 r/min. at a distance of 1 cm. The same intensity of X-rays and gamma rays of radium was employed on wheat seedlings, drosophila eggs, and human skin. The gamma rays of radium were two and nine-tenths times as effective as X-rays in retarding the growth of shoots of wheat seedlings, four and one-tenth times as effective in killing drosophila eggs, and one and two-tenths times as effective in producing erythema of the human skin.

CHARLES H. HATCOCK, M.D.

Zimmern, A., Chavany, J. A., and Brunet, R.: Radiotherapy of Dry Gangrene by Irradiation of the Adrenal Region (La radiothérapie des gangrènes sèches par irradiation de la région surrénale). *Presse méd.*, Par., 1931, xxxix, 1061.

Gangrenous processes of the limbs, especially the upper limbs, are frequent in the course of evolution of obliterating arteritis. Their incidence seems to have increased during the last few years. The authors discuss only the dry form of arteritic gangrene. This occurs in many diseases, among which are senile arteritis, diabetic arteritis, syphilitic arteritis, and arteritis coming on early.

Specific treatment relieves the pain but not the gangrenous symptoms of intermittent claudication. Insulin gives favorable results. Injections of hypertonic sodium chloride solution (Silbert's method), if continued over a long period, result in considerable improvement in Buerger's disease. Sodium nitrite and the intravenous administration of sodium citrate have been recommended. Applications of heated air seem beneficial. Diathermy has a favorable action on the pain, but not on the gangrene. The combination of diathermy with intensive insulin treatment is recommended. Resection of the obliterated arterial segment, periarterial sympathectomy, adrenalectomy, and amputation are the surgical methods usually considered. Those who maintain an expectant attitude recommend aseptic dressings, balsam of Peru, aromatic wine, Lucas-Championnière powder, and hot air.

Von Oppel concluded that the symptoms, intermittent claudication, and trophic disturbances of the extremities observed in juvenile arteritis of the Buerger type are dependent upon a permanent arterial spasm maintained by hyperadrenalinemia due to hyperfunction of the adrenals. He therefore treated the condition by unilateral adrenalectomy. This operation, which has since been performed by several surgeons, has resulted in evident improvement. However, it has a quite high immediate mortality (13 per cent, according to Leriche) and exposes the patient to acute adrenal insufficiency.

The authors review the results of radiotherapy in intermittent claudication and Raynaud's disease which have been reported in the literature. In their own cases the diffuse cyanosis surrounding the lesion became paler and the extremity became warmer, only the necrosed zone remaining cold. In the most favorable cases the tissues which had begun to degenerate became slowly revitalized. The wound showed a marked tendency to flatten out. In diminishing in depth it appeared to increase in surface. After it had become cleansed it began to decrease in size. In some cases the pain ceased after one or two treatments, but in others it persisted and sometimes was severe. No treatment including the application of moist compresses should be used with radiotherapy. The authors employed Lucas-Championnière powder.

Eight cases are reported. The similarity in the effects of radiotherapy and those of adrenalectomy suggests that the original site of the processes resulting in gangrene is the adrenal gland. As adrenalectomy involves the section of numerous splanchnic fibers and the removal of an organ very rich in ganglionic cells, it is comparable to a sympathectomy. The sympathetic and glandular theories are not mutually exclusive.

In conclusion the authors state that while the clinical evidence seems to indicate that the gangrene is dependent upon excessive functioning of the adrenals, other factors are doubtless involved. PAGE.

RADIUM

Gallavres, L.: Blood Changes in Patients Subjected to Intensive Radium Therapy (Le modificazioni del quadro ematologico nei pazienti sottoposti a radiumterapia intensiva). *Radiol. med.*, 1931, xviii, 926.

The author reports from the Radiological Institute of the Royal University of Milan his studies of the blood changes in thirty patients with various forms of malignant disease who had received intensive external radium treatment with an epidermic dose of gamma rays (about 40 Dominici units of Mallet

and Coliez) in a period of about fifteen days. The blood was examined before the treatment and at intervals up to the one hundred and fifth day after the treatment.

Slight changes were noted in the erythrocytes; sometimes there was an increase but more often there was a decrease. Rarely was there a drop of more than a million. The hæmoglobin values tended to follow the erythrocyte level with a certain lag behind the changes in the latter. The reticulocytes were constantly increased after the treatment. There was a marked decrease in the leucocytes, which occasionally followed a transitory period of increase. The leucopænia which resulted was characterized by neutropænia and absolute lymphopenia associated with a relative increase of neutrophils and a more marked relative decrease of the lymphocytes. These changes paralleled the doses of irradiation absorbed by the body. Shortly after the treatment the Arneth formula shifted to the left, but subsequently it tended to shift to the right. Morphological changes in the blood cells were not very definite, but occasionally immature cells of the leucocyte series were found.

These changes were of a transitory nature, never lasting more than three months, and had no detectable effect on the general condition.

EUGENE T. LEDDY, M.D.

MISCELLANEOUS

Watson, C.: Radiation in Relation to Human and Animal Nutrition; with a Theory as to the Nature of Vitamins. *Proc. Roy. Soc. Med.*, Lond., 1931, xxiv, 1473.

The object of this article is to direct attention to the possibility that vitamins may be of biophysical rather than biochemical origin. The author advances the hypothesis that they may be identical with the light energy arising from irradiation. This hypothesis is based on:

1. Experimental evidence of a remarkable and uniform influence of milk upon rats fed on rice, porridge, and horse flesh respectively, and the fact that

the symptoms observed in the animals definitely included those commonly accepted as characteristic of a deficiency of Vitamin A and Vitamin D.

2. The striking curative influence of irradiated milk on rickets, and the fact that this influence is exerted by hand-skimmed milk and separated milk containing not more than 0.15 per cent of fat. The author states that the findings render doubtful the correctness of the theory regarding the presence of an essential relationship between the active principles in the milk and fat solubility.

3. The clinical value of the Gerson diet with its known richness in vitamins.

4. Knowledge of plant nutrition which suggests the identity of the vitamin with the light energy and wave lengths in particular areas of the electromagnetic spectrum.

In conclusion the author states that, in nature, vitamins are found only in the vegetable kingdom. Vitamins in animal tissues are derived from the vegetable foods consumed by the animal. The solar energy acting on the cells of a plant initiates the chemical energy which promotes the healthy growth, maturation, and reproductive processes of the plant. Healthy growth implies resistance to disease, e.g., freedom from infections. In accordance with the law of conservation of energy, the energy in vegetable food consumed by an animal is passed on to the tissues of the animal. Solar energy can be used artificially in the production of vitamins, e.g., irradiation of the body with the ultraviolet rays in actinotherapeutics and the exposure of milk and of medicinal substances such as ergosterol and cod liver oil to the ultraviolet rays. Solar energy is transformed in nature and by artificial means into chemical energy. It is apparent that between the chemical energy stored up in the plant or substance and the sunlight energy which starts the process there is a very close relationship. To explain the different known vitamins, the author suggests that the production of the vitamin or vitamins specific to the plant may be analogous to the selective power of the plant with regard to color.

ADOLPH HARTUNG, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Thatcher, L.: Hypervitaminosis-D, with the Report of a Fatal Case in a Child. *Edinburgh M. J.*, 1931, xxviii, 457.

The case reported was that of a boy aged eighteen months. The pathological report on the tissues and the condition of the kidneys is given in detail.

Hypervitaminosis-D is characterized by anorexia with marked inanition and loss of weight, diarrhoea, slowing of the pulse, hypercalcaemia, an increase in the inorganic phosphate in the blood, and a gross increase in the calcium output in the urine.

Irradiated ergosterol may be toxic to infants when given in excessive doses or over too long a period of time. In some cases there may be an idiosyncrasy to it. The symptoms of intolerance are well defined and should be borne in mind whenever the drug is used. Non-rachitic babies are more susceptible than those with florid rickets. Irradiated ergosterol should be used with special caution in summer and should not be given to feeble or premature infants. There is no evidence that it is superior to cod liver oil for either the prevention or the cure of rickets. The influence of its content of Vitamin A on growth, development, and susceptibility to infection is to be regarded as a valuable adjunct to the specific action of the Vitamin D on the calcium-phosphorus metabolism and the calcification of bone.

CARL R. STEINKE, M.D.

Saunders, E. W.: Diabetes in Relation to Surgery. *Ann. Surg.*, 1931, xciv, 161.

Surgery is most often indicated for older diabetics who have not had treatment and for those living under unhygienic conditions. It is seldom required for diabetics who are well cared for. The prolonged use of a diet with a high fat and a low carbohydrate content undoubtedly predisposes to early arteriosclerosis. The author reviews the cases of eighty diabetics requiring surgery who had been untreated or had been restricted to a diet with a low carbohydrate and high fat content, or had received insulin only occasionally.

Inflammatory lesions of the stomach, duodenum, gall bladder, and pancreas may bring about a transient glycosuria in the absence of diabetes. In such cases insulin guarded by glucose should be given even though the hypoglycemic state will allow conservative surgery.

The difficulty of differentiating an acute surgical condition of the abdomen from impending diabetic coma is often due to the fact that inflammation about the pancreas and duodenum may increase the diabetes by producing oedema of the pancreas.

The author's observations seem to indicate that the diabetic requiring surgery is suffering from complications more severe than the diabetes.

WILLIAM J. PICKETT, M.D.

Leriche, R., and Howes, E. L.: Research on the Anatomy and Physiology of Cicatrices (*Recherches sur l'anatomie et la physiologie des cicatrices*). *Presse Méd.*, Par., 1931, xxxi, 1011.

The authors studied ninety-six cicatrices with regard to their macroscopic appearance, their tactile, pain, and heat sensibility, and their suppleness. Sixty-nine per cent were linear cicatrices due to sutured surgical wounds with an aseptic course, 14 per cent were large cicatrices formed after an extensive loss of substance, and 17 per cent were the scars of infected or drained wounds of moderate size.

The temperature of the cicatrix and the surrounding normal tissue was measured with the Leeds and Northrup apparatus. Forty-one cicatrices were examined histologically with hæmatoxylin-eosin staining and the use of the Pal-Weigert and Bielchowsky procedures. The cellular morphology of the epithelium, the quantities of fibrous and elastic tissue, the presence of myelin and amyelinic nerve fibers, and the presence of tactile corpuscles were studied. The resistance to tension was determined by the method employed by Howes, Harvey, and Sooy.

The loss of sensibility varied directly with the dimensions, but only slightly with the age, of the cicatrix. In very large cicatrices all sensibility, even for deep pressures, was abolished. At the periphery of all large cicatrices there was a zone in which sensibility was restored as soon as epidermization was complete, but it was diminished and along a narrow strip was without tactile discrimination. This zone became larger as the scar became older, but it never exceeded a border measuring an eighth of the diameter of the surface.

When the cicatrices are considered according to size, the losses of sensibility occurred in the following order: tactile discrimination, partial loss of the sense of pain, touch, and coldness, complete insensibility to touch, pain, and heat (these seemed to be equal), and complete insensibility to pressure. In five scars there was marked hyperæsthesia to pain.

During the stage of redness, large and moderate sized scars showed an average thermal elevation of 5 degrees in comparison with the surrounding normal tissues. During the white stage they were from 0.5 to 1 degree colder than the normal tissue. The keloids showed a difference of 1.5 degrees.

The thickness of the epithelium was diminished and the number of cellular layers considerably reduced in comparison with the normal. It was often

impossible to distinguish the four normal layers. The keratin layer was very poor, and the layer of basal cells extraordinarily rich, in pigment and chromatic granules. The intercellular bridges were not so clearly visible as under normal conditions and often showed compressed and deformed cells. The protoplasm of these cells stained deep red and their nuclei were pyknotic. The epithelium of keloid cicatrices was a little thicker than that of others, but the thickness was not sufficient to explain the hyperelevation of the scar.

In linear scars four months old, amyelinic nerve fibers were found among the epithelial cells. In medium and large cicatrices in which the structural relationships were disturbed, none could be discovered.

The fibrous tissue showed the most marked deviation. In cicatrices less than six months old there were many capillaries and young fibroblasts. During the first two years the fibrous tissue was entirely devoid of elastic fibers. The cicatricial tissue showed no hair follicles, sebaceous glands, adipose tissue, or tactile corpuscles.

Amyelinic nerve fibers were seen at the end of three weeks at the periphery of the fibrous portion of the cicatrix. After six months they were everywhere in large numbers. Myelinic fibers were seen at the periphery only after the fifth week and were not found throughout the cicatrix until after the seventh month.

These findings do not prove that the re-appearance of the nerves in a cicatrix influence its organization unless one takes as negative proof of this influence the fact that in keloids and contracted cicatrices, where organization is disordered, nerves are rare and sensibility is very diminished.

Whatever may be the cause of the disappearance of the vessels, the mass of cicatricial tissue is a rather avascular formation. Consequently its vitality is low.

The increase in the number of horizontal fibrous fasciculi is a factor in the organization of cicatrices.

The initial absence of elastic tissue explains the lack of suppleness of cicatrices.

The prevention of defective cicatrization depends upon the initial treatment of the wound. Incisions should be made in the direction of the fibers. In traumatic wounds, excision with early suture should be done when possible. In wounds abandoned to secondary union, secondary suture and early skin grafting should be done more frequently. PACE.

Haythorn, S. R.: *Studies on the Histogenesis of the So-Called "Basal-Cell Carcinoma."* *Am. J. Cancer*, 1931, xv, 1969.

The author reports a study of 412 skin neoplasms taken from hair-bearing areas, of which 144 were of the so-called basal-cell type. The relationship of the tumors to the hair follicles was especially investigated.

The term "basal-cell carcinoma" was introduced by Krompecher to designate a group of squamous-cell tumors of the skin and mucous membranes

which do not cornify and which Krompecher believed are intermediate between adenocarcinoma and epithelioma.

The author presents photomicrographs indicating that the neoplastic changes affect the hair matrix after its differentiation from the basal-cell layer of the skin, and that the tumors do not arise directly from the basal cells of the rete malpighii as believed by Krompecher. He states that basal cells are prickly cells, and that the differentiation in tumors is away from prickly cells and toward spindle cells like those found in hair follicles. He therefore believes that the tumors are more correctly designated as "hair-matrix carcinoma."

M. HERBERT BARKER, M.D.

DUCTLESS GLANDS

Collip, J. B.: *The Physiology of the Parathyroid Glands.* *Canadian M. Ass. J.*, 1931, xxiv, 646.

Collip reviews the more recent developments in the physiology of the parathyroid glands.

The physiological effect of the internal secretion of the parathyroid glands is mobilization of the blood-plasma calcium. The source of the additional calcium which appears in the blood stream under the influence of parathyroid extract is bone. After overdosage with the parathyroid hormone the blood-serum calcium gradually rises to a level of 20 mgm. per 100 c.cm. where it remains for several hours and then falls a few milligrams per 100 c.cm. in the terminal stages. The inorganic phosphorus of the blood serum is unaffected until the calcium of the blood serum reaches a level of 15 mgm. per 100 c.cm. It then rises rapidly until death results. Tissue analyses for calcium made at different levels of hypercalcemia indicate that no marked increase in the calcium content of such tissues as muscle and liver occurs until the peak of the curve of the serum calcium has been passed and the terminal phenomena of overdosage with parathyroid hormone have appeared.

Vitamin D has an effect on calcium metabolism almost equal to that of the parathyroids. It has a definite relation to increased calcium absorption, but whether or not it can mobilize calcium from the bone reserves is not known. The interrelationship of Vitamin D and the parathyroid hormone has not been determined exactly.

Clinical conditions in which calcium metabolism or parathyroid function is disturbed include tetany, osteomalacia, hunger osteopathy, renal rickets, celiac rickets, chorea, and the generalized osteitis fibrosa of von Recklinghausen. ELIZABETH CRANSTON.

Ballin, M., and Morse, P. F.: *Parathyroidism.* *Am. J. Surg.*, 1931, xii, 403.

The conclusions drawn by Ballin and Morse from their study of parathyroidism are summarized as follows:

1. Parathyroidism seems to be a very frequent affection and will be discovered often if its symp-

toms are looked for and interpreted properly. At least a mild degree of the condition seems to be very common.

2. It is characterized by general decalcification of the bones and the formation of localized cystic areas, usually with severe pain in the bones, especially in the back and legs. The combination of these changes with a high blood calcium and lowered blood phosphorus should be sufficient to lead to an examination of the parathyroids for tumor or hyperplasia.

3. The parathyroid tumor or hyperplastic gland should be removed. With proper after-care, including the administration of parathyroid hormone (Collip's extract) and calcium preparations, the operation appears to be fairly safe.

ELIZABETH CRANSTON.

Taylor, N. B., Weld, C. B., Branion, H. D., and Kay, H. D.: A Study of the Action of Irradiated Ergosterol and of Its Relationship to Parathyroid Function. *Canadian M. Ass. J.*, 1931, **xxv**, 703 and **xxv**, 20.

This article reviews a number of experiments which have yielded new evidence of a close relationship between the overdosage effects of irradiated ergosterol and parathyroid function. This relationship is thought to be a direct one, namely, the stimulation of parathyroid tissue by the sterol.

Adult dogs died following the administration of irradiated ergosterol when the amount given per kilo

had a greater potency than twenty times that of the maximal therapeutic dose. Puppies showed a greater susceptibility to overdosage than full-grown animals.

The symptoms and postmortem findings in the blood following overdosage with irradiated ergosterol are indistinguishable from those resulting from the administration of lethal doses of parathormone. The chemical character of the blood, insofar as this has been investigated, is affected in an almost identical manner by either substance.

The effects of excessive doses of irradiated ergosterol upon calcium and phosphorus metabolism run closely parallel with those resulting from parathyroid overdosage.

It is pointed out that the species which show a high resistance to the toxic action of irradiated ergosterol are tolerant to a corresponding degree to the action of parathormone. Since, as contrasted with other species, the dog and the human subject are highly susceptible to the hormone, it is suggested that man may share with the dog a high susceptibility to irradiated ergosterol. Clinical observations supporting this assumption are cited.

The authors' experiments and those of others indicate that, when the dosage of irradiated ergosterol is increased from small to very large amounts, its effect upon calcium metabolism is reversed, a parathormone-like action becoming manifest. The exact level of dosage at which the reversal of action occurs is unknown.

JACOB M. MORV, M.D.

BIBLIOGRAPHY of CURRENT LITERATURE

NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THIS ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND.

SURGERY OF THE HEAD AND NECK

Head

A case of serous dermoid cyst of the anterior fontanelle. A. CARDIA. *Ann. ital. di chir.*, 1931, x, 735.

A papilliferous cystoma of the petrous bone associated with a hypernephroma and a cystic pancreas. G. JEFFERSON and R. WHITEHEAD. *Brit. J. Surg.*, 1931, xix, 55. [521]

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Neoplasms in the lower primates, with a description of an osteogenic sarcoma of the jaw in a macacus rhesus. H. J. BAGG. *Am. J. Cancer*, 1931, xv, 2143.

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Cases of localized osteitis fibrosa of Recklinghausen of the inferior maxilla. V. HLAVÁČEK. *Otolaryngol. slav.*, 1931, iii, 308.

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